ITHACA, NEW YORK
February, 1929
Vol. II Fasc. I

GENTES HERBARUM

Art. 1. De Ophiopogone et Liriopa
Art. 2. De Diervilla et Weigela
Art. 3. De Muehlenbeckia

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GENTES HERBARUM

(The Kinds of Plants)

By L. H. BAILEY

1. The Case of Ophiopogon and Liriope
2. The Case of Diervilla and Weigela
3. The Case of Muehlenbeckia

Published
(Mailed at Ithaca Post Office to regular list)
February 15, 1929

FIG. 1. LIRIOPE MUSCARI, THE BIG BLUE LILY-TURF.—Evergreen perennial with attractive foliage and flowers

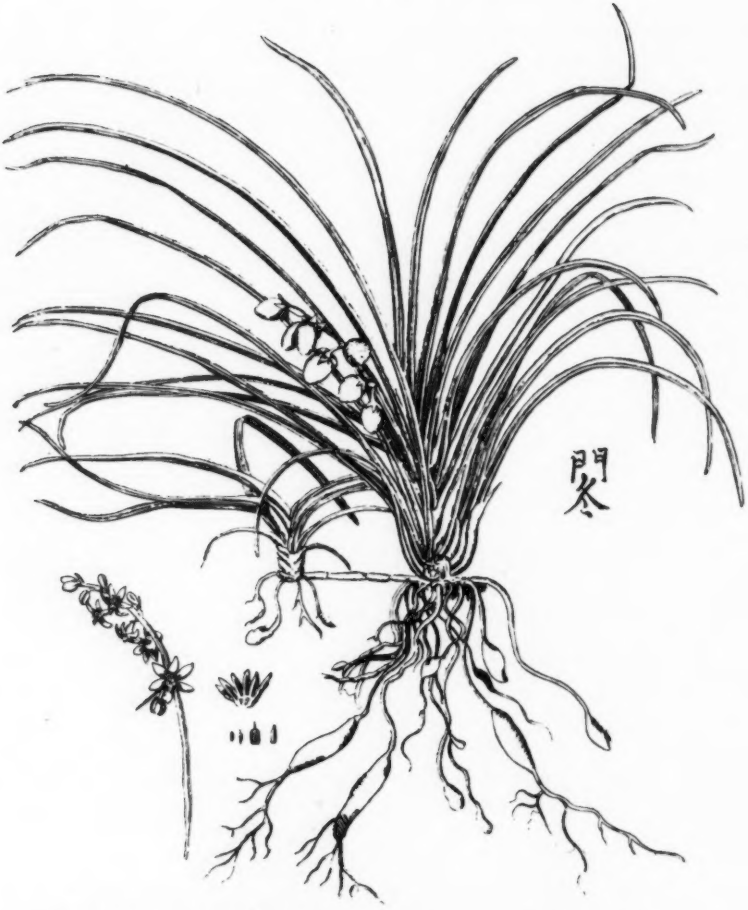
ARTICLE 1. THE CASE OF OPHIOPOGON AND LIRIOPE

A DISCUSSION OF THE CULTIVATED LILY-TURFS

Several kinds of East-Asian tenacious perennial evergreen acaulescent herbs are in cultivation in western countries under the names Liriope and Ophiopogon. One of them is seen in Fig. 1. They have no vernacular English names, although Snake's-beard or Snakebeard may be given in books as a translation of the word Ophiopogon but this name has no significance to us; and it also turns out that the name Ophiopogon must be given up in botanical usage. They are low sod-forming or turfing plants of the lily family, and may well be called lily-turfs.

These are plants with grass-like leaves and racemes or spikes of small lilac, blue or white flowers on scapes among the foliage. They make extensive ground-covers, withstanding heat, drought and shade; they are durable pot plants for porches and living rooms. They thrive in warm and tropical countries and at least one of them stands in the open as far north as Boston, and in the vicinity of New York and Washington others are hardy and vigorous. They have been so long known as pot plants in greenhouses and conservatories that they have not been sufficiently tried out-of-doors in the northern parts of the country, and therefore their full adaptability is not yet understood. It is probable that these will become highly important plants for outdoor work, as ground-covers under many conditions and uses, as edgings and as clumps of ornamental subjects. It is hoped that this paper will bring out additional experience; and I plan to make a supplementary report.

The knowledge of these plants is singularly confused and inexact, and the botany of them is in need of clarification. The plants are commonly misnamed in nurseries and the pictures in books are not reliable; specimens are likely to be wrongly determined in herbaria. I am compelled, therefore, to attempt to check up the names and identities of the kinds in cultivation, until such time as the genera are monographed, and I have reviewed related species that have come to my hand in the form of herbarium material. I have had these plants in mind for many years and have grown them at Ithaca, N. Y., in an unheated greenhouse, and now have several kinds planted in the open to test their hardiness, and I have collected them in China and in plantations in the United States, England and tropical America. Growing plants, in flower and fruit, are before me as I write. I have examined the material in the National Herbarium,



麥門冬 *Mondo & Biakf Mondo*, vulgò *Riuno Fige*, *Siogei Fige*, *Jamáſuje* & *Sogaiì*. Gramen flore hexapetaloide ſpicato, Radice fibroſâ & tuberoſâ.

Rjuno Fige, i. e. Barba ſerpentina ob aliqualem ſimilitudinem dicta. Gramen eſt perenne, pro limitandis areolis expetitum; funiculis humi repentibus brevibus,

FIG. 2. MONDO JAPONICUM, the Dwarf Lily-turf; Kaempfer's figure, and part of the text, 1712, quoted by the early authors.

Washington, and in the herbarium of the New York Botanical Garden; and all the mounted collections of the Gray Herbarium and of the Missouri Botanical Garden have been loaned me, and specimens from the University of California. Living plants have been supplied me by the United States Botanic Garden, Washington. I am under obligation to these institutions and to many persons for help with specimens and notes, particularly to H. H. Hume of the Glen St. Mary Nurseries in northern Florida, who has supplied me with much living material.

Mr. Hume considers them wonderful plants, with a remarkably wide range of application. When better known and tested for out-of-door work we shall probably be surprised with their usefulness. Mr. Hume sends me the following comments: "Covering bare ground with vegetation on gravelly or sandy slopes and beneath trees has always been a difficult undertaking. Grasses are usually worthless and garden-makers have made use of various other plants for the purpose. Few of them are entirely satisfactory and most of them have drawbacks of one kind or another.

"There is, however, a small group of plants belonging to two closely related genera of the lily family, Ophiopogon and Liriope, that for large sections of the country far excel any other plants as ground-covers. This group is represented in the southern United States by several different plants, five green and two variegated. All are grass-like in appearance, although varying in height.

"They have a wide range of adaptability. Heavy frosts, and even snows do not affect them adversely, and they are at home under tropical conditions. They grow well on moist soils, and once established are exceedingly drought-resistant. It makes little difference whether the soil is rich or poor, and sun or shade is all alike to them.

"In strong sunshine the liriopes are perhaps preferable because their spikes of beautiful lilac flowers give them an advantage over the ophiopogons.

"While the greatest use of these plants is for ground-covers, they are valuable for edging walks, flower-beds and for grouping in the edges of shrubbery borders. For flower-boxes or pots in difficult places they possess all the hardihood of aspidistra."

Individually the flowers of the lily-turfs are not showy, although those of the Jaburan are large enough to command attention; but collectively in the spikes or racemes they make a colorful display, in connection with the mass of attractive foliage. They do not open together in the spike, but the buds are as colorful as the expanded flowers; they open in evening or morning.

Explanation.—For the convenience of bibliographers a dagger (†) is placed against new binomials and combinations. The abbreviation n.tr. is new transfer (*translatio nova*): see Gent. Herb. 1, p. 8.

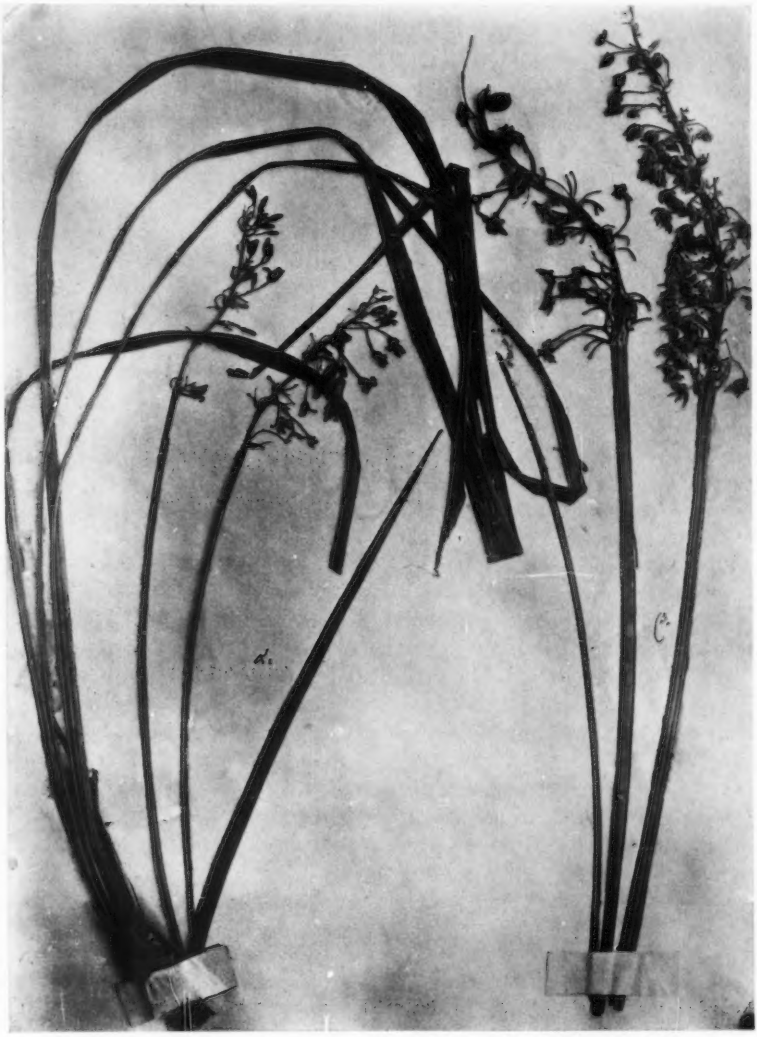


FIG. 3. CONVALLARIA JAPONICA α of Thunberg's herbarium, considered to represent what is here known as Mondo Jaburan; Upsala.

BOTANICAL HISTORY OF THE LILY-TURFS

1. *The Mondos*

For our purpose the botanical history of the lily-turfs begins with Engelbert Kaempfer, Amoenitatum Exoticarum, published in 1712. Here is described and illustrated the plant "Mondo & Biakf Mondo, vulgo Riuno Fige" and other vernaculars (Fig. 2). On this figure various botanical names are founded, and in recent time it has been known as *Ophiopogon japonicus*. Kaempfer characterizes it as "gramen flore hexapetaloide spicato, Radice fibrosa & tuberosa": that is, grass or plant with flowers 6-petal-like and in spikes, the root fibrous and tuberous; and thereafter follows a Latin description. He states that the vernacular Japanese name Riuno Fige (or Rjuno Fige) signifies "serpent's beard," but the resemblance is not explained nor is it obvious; this idea reappears later in the name Ophiopogon or "snake's beard."

Kaempfer's name does not hold in botanical nomenclature because it is pre-Linnaean; but Adanson in his "Familles des Plantes" in 1763 takes up and establishes Mondo as a generic name, with proper reference to Kaempfer's figure. This generic name is not rejected by the International Rules and its restoration is inescapable under any rule of nomenclature, although it appears to have been overlooked or disregarded by writers until advanced by O. A. Farwell in 1921 and independently by Koidzumi in 1926. It is strange, despite Kaempfer's clear description and the plate with good analyses, and Ker-Gawler's reference to it in Botanical Magazine as early as 1808 and Loddiges' in 1821, that later lists refer Mondo to Carex. Neither Kaempfer or Adanson uses the word Mondo in a way to indicate gender; Farwell adopts the word as neuter and Koidzumi as feminine.

The Kaempfer account is made the basis of record by Thunberg in 1780 in his Kaempferus Illustratus (Nov. Act. Reg. Soc. Upsal. iii, 208), where the plant is given its first binomial name as *Convallaria Japonica*, "scapo nudo, ancipiti." Entry of the Thunberg plant is made by the younger Linnaeus in 1781 in Supplementum Plantarum, as *Convallaria Japonica*, "scapo nudo ancipiti, floribus racemosis secundis, foliis linearibus scapo triplo longioribus." Thunberg treats this and related plants in two subsequent publications and the interpretation of his work is now essential.

Fortunately, the specimens are extant in the Thunberg herbarium at Upsala in Sweden; and fortunately, also, Dr. O. Juel, then Professor of Botany and Director of the Botanical Institution of the University in Upsala (now Professor Emeritus), has been interested in the critical interpretation of Thunberg's systematic work. He has taken much pains to aid in the present quest and to provide the three photographs of the Thunberg

FIG. 4. MONDO JABURAN.—The starting-point of the name Ophiopogon Jaburan, in Loddiges' Botanical Cabinet, t. 1876 (1832)

plants presented in this paper, for which help I am grateful. I am also under obligation to Professor G. Koidzumi, Kyoto, for notes he has sent me.

Thunberg takes up the case of the Convallarias again in Flora Japonica, 1784, but now he has two plants, or, as he writes, "Duplex varietas datur, maior et minor," although he does not actually apply these names to the plants, as one would infer from the citations in subsequent literature. The two plants are a tall one and a low one, designated as *Convallaria Japonica* α and β. The latter form, β, is the low Mondo of Kaempfer as shown by the citation and also by the description of the very narrow incurved secund leaves and the short scape: it is the plant that four years earlier he had called *Convallaria Japonica*.

The form α of the Flora Japonica is a much taller plant than β; and Dr. Juel writes, "I find it quite natural that he should consider it the principal type of the species and the other a reduced form of it." This plant, as the herbarium discloses (Fig. 3), is apparently what we have later known as *Ophiopogon Jaburan*, as illustrated in color in Loddiges' Botanical Cabinet, t. 1876 (1832), although in horticulture this name has been erroneously transferred to a wholly different plant (to *Liriope Muscari*); the illustration in Loddiges is reproduced in Fig. 4; it is with this plate and description that the name Jaburan starts with what may be considered a diagnosis. Thunberg's α is well described as having pedicels ("pedunculi") filiform at base and thickened from the middle upwards and white in color, and as having a white corolla: these are good marks of *Ophiopogon Jaburan*.

It seems that Thunberg subsequently rearranged his herbarium to express his maturer ideas, putting the specimens on new sheets. He published his catalogue of the herbarium in 1792 under the title "Museum Naturalium Academiæ Upsaliensis." He had come to the conclusion that the two varieties of the Convallaria in the Flora Japonica are really two species. On page 97 of Part xii of the catalogue he enters the name *Convallaria cernua* but without description; what he meant by this name is to be made out, as Dr. Juel writes, only by consulting his herbarium.

When Thunberg wrote Flora Japonica he had three specimens of what he then considered to be *Convallaria Japonica*, α, β, γ, these Greek letters standing merely as numbers and not for varieties. Nos. α and β were the tall form (var. α of the Flora Japonica), and No. γ the low form (var. β of the Flora, or *C. Japonica* of his 1780 treatment). At present there is only one sheet exclusively marked by him *C. Japonica* (Fig. 3), bearing two specimens numbered α and β; these are the tall plants in the treatment in the Flora. There is also one sheet of *C. cernua*, one of which is numbered γ: that is, the *C. Japonica* of 1780 and the var. β of 1784 become *C. cernua* and the name *C. Japonica* is transferred to the tall form (which we now discover to be another species). This sheet of *C. cernua* (Fig. 5)

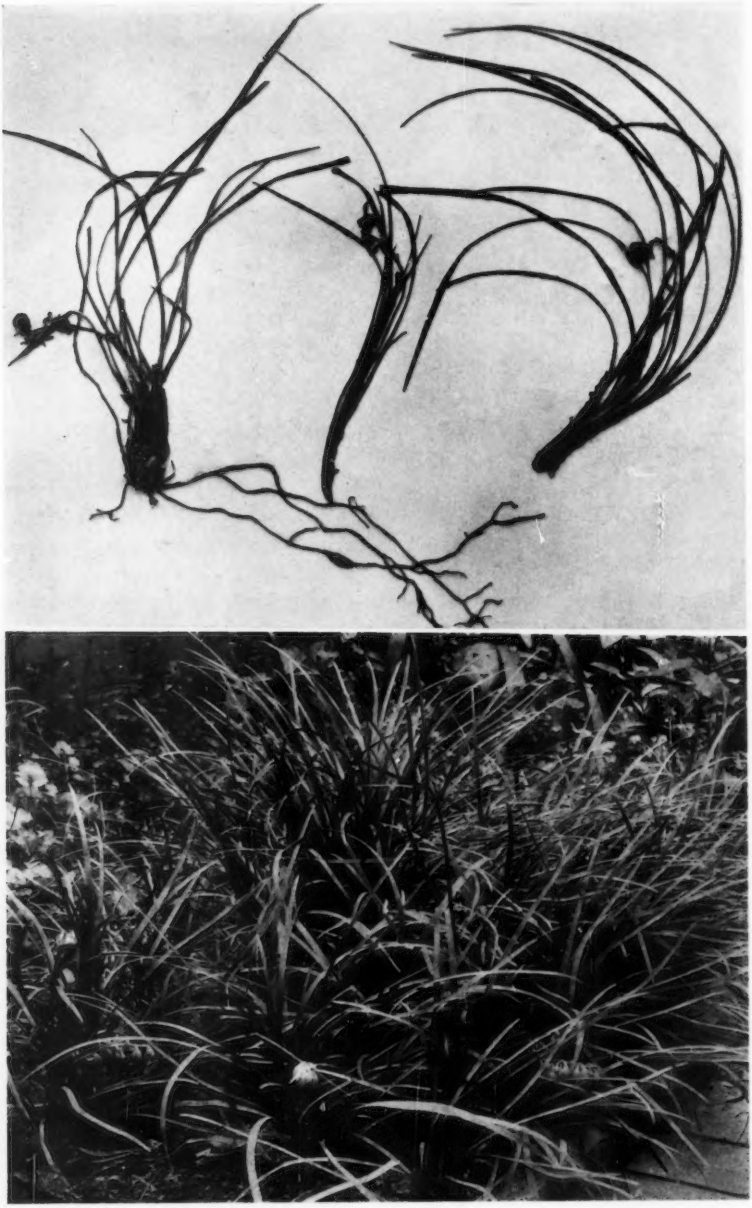


FIG. 5. MONDO JAPONICUM.—Upper figure, Thunberg's type of Convallaria Japonica, one-half natural size; Upsala. Lower, plants growing in a border.

bears three specimens, all from Japan and all the same plant; one of them is from a garden. (His herbarium contains two other specimens or sheets of *C. cernua*, one from the Botanical Garden in Amsterdam and one without locality but presumably also from a garden; these specimens appear to be of no significance to the present inquiry and therefore no account is taken of them).

Such shifts in names were considered to be legitimate in Thunberg's time but we cannot adopt them now. It is our obligation to accept his first *C. Japonica*, 1780, and to make his *C. cernua* a synonym of it. In fact, we are not bound to recognize his *cernua* at all because it was never published and is a *nomen nudum*.

The next botanical name for the plant is *Polygonastrum compressum*, of Moench in Supplementum ad Method. Plant., 1802, with reference to the Mondo of Kaempfer; this binomial is little cited.

The dwarf mondo or lily-turf, known heretofore as *Ophiopogon japonicus*, came into cultivation in Europe toward the end of the eighteenth century and early in the past century it began to receive attention in the publications. It has had a devious botanical history, in six genera: Mondo, Convallaria, Polygonastrum, Ophiopogon, Flueggea, Slateria, and perhaps also in the Chloopsis of Blume, 1827. In 1807 or 1808 Ker-Gawler published a description of it in Botanical Magazine, London, with a colored plate (t. 1063); he proposed for it the genus Ophiopogon, taking it out of Convallaria (a genus now restricted to the lilies-of-the-valley), in which Thunberg, followed by the younger Linnaeus, had placed it.

Independently in the year 1807 Louis Claude Richard, of Paris, presented an account of the plant, with careful engravings of the floral structure, in Schrader's Neues Journal für die Botanik published in Erfurt; finding it untenable in Convallaria, he founded the generic name Flüggea (presumably in honor of J. Flügge, a writer on grasses), the species becoming *F. japonica*. Although the two genera, Ophiopogon and Flueggea, were founded in publications of similar date, Ker-Gawler subsequently states (Botanical Register, 1821, t. 593) that Ophiopogon has actual priority.

The following year (1808) N. A. Desvaux reviewed Richard's publication in Journal de Botanique, Paris, called attention to the fact that the name Flüggea had been earlier applied to another plant and proposed the name Slateria, in honor of an English botanist and cultivator; the plant then became *Slateria japonica*.

There are curious confusions in other species of Mondo, to which we shall come in due course; the foregoing discussion sufficiently indicates for the moment the nature of the problem.

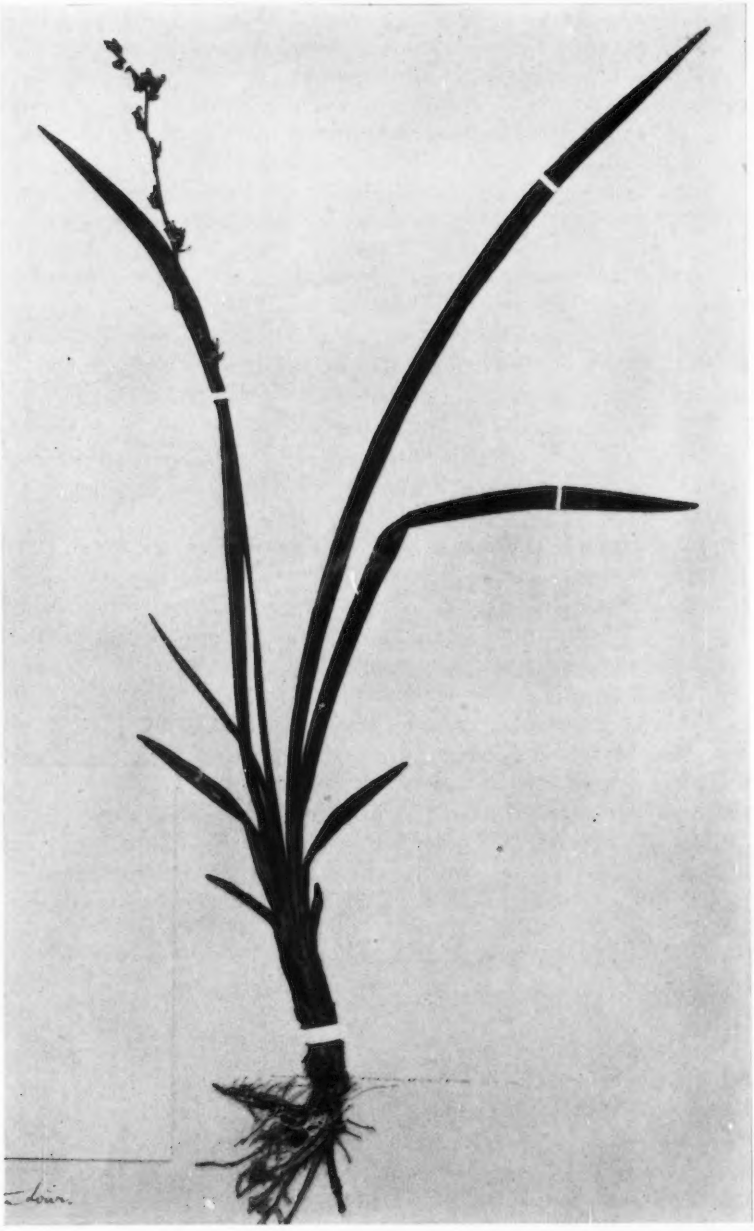


FIG. 6. LIRIOPE SPICATA.—Type specimen of Loureiro, one-half natural size; Paris

2. *The Liriopes*

Our interest does not end with the two Mondos (or Ophiopogons). Another and closely related set of plants is grown in North America, also of two main species; these are the liriopes.

Loureiro's genus Liriope, in 1790, (Liri-ope, a nymph) calls for a plant with superior ovary. He proposes a single species, *L. spicata*, a plant with leaves one foot long and a scape of about the same length. He does not cite a contemporary, yet Thunberg describes a *Convallaria spicata* in Flora Japonica, 1784, and which has a superior ovary, although the descriptions in the two authors of filaments, anthers and fruits are not harmonious. The names *Liriope spicata* and *Convallaria spicata* are regarded as synonyms in subsequent literature. Fortunately, the type specimens of both Loureiro and Thunberg are extant and I have good photographs of them (Figs. 6 and 7); and I think them to represent different species, *L. spicata* proper and *L. Muscari* var. *exiliflora*.

In the Botanical Register for 1821 (sub. t. 593), where *Liriope spicata* is cited (as a synonym of *Ophiopogon spicatus*) we read that the identity of the Loureiro plant was "communicated by Mr. Brown, who has ascertained it from the original sample in the Herbarium of the Museum of Natural History at Paris; where a portion of Loureiro's Botanical Collection had found its way from Lisbon during the pillage of the late wars." Acting on this clue I applied to M. Henri Lecomte of the Museum National d'Histoire Naturelle and through his courtesy am able to present a reproduction of a photograph of the "portion" in Fig. 6. Under a lens the floral characters of the photograph itself are fairly clear and it is undoubtedly the plant figured as *Ophiopogon spicatus* in Loddiges' Botanical Cabinet, t. 694 (Fig. 8).

Long before Thunberg and Loureiro, however, this plant, or a similar one, had a name, the *Asparagus graminifolius* and also *Dracaena graminifolia* of Linnaeus. J. G. Baker long ago (1875) brought up Linnaeus' name, making the *spicata* plant *Liriope graminifolia;* but I am not convinced of the validity of this transfer; see page 31.

Whether Liriope and Ophiopogon should be retained as distinct genera I do not now undertake to say for I am not monographing the group but endeavoring primarily to account for the cultivated plants; Koidzumi places plants of the two morphologies under the one genus Mondo. I do not forget that long ago Maximowicz reviewed the group and united the genera (Bulletin de l'Académie Impériale des Sciences de Saint-Pétersbourg, 1869-1871). He used the name Ophiopogon for the united group, rather than the older Liriope. In those days the rules of priority were less exact than now; and Maximowicz had good precedent in Endlicher and others, for the name Liriope long lay in retirement; Ker-Gawler had made the union in 1808 (Bot. Mag. t. 1063), and in 1821 (Bot. Reg. t.

FIG. 7. LIRIOPE MUSCARI var. EXILIFLORA.—The Convallaria spicata of Thunberg; Upsala.

FIG. 8. LIRIOPE SPICATA.—Ophiopogon spicatus of Loddiges' Botanical Cabinet, t. 694 (1822).

593), as already noted. Subsequent standard authorities retain two genera; and the question of their ultimate status involves a morphological study of related groups. If the genera are united, the name Mondo will hold for the combined group. So far as my own studies have gone, the two genera seem to be as well differentiated as most other genera of the Liliaceæ.

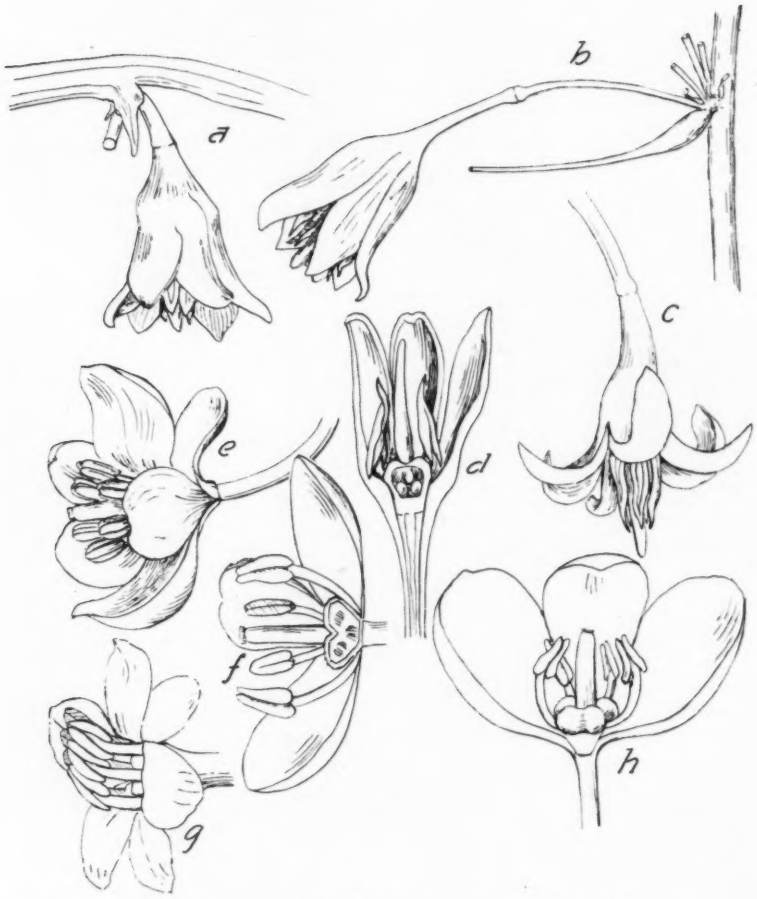


FIG. 9. MONDO AND LIRIOPE.—a, Mondo japonicum (×4); b, M. n.sp.? p. 27 (×5); c, d. M. Jaburan (× 2); e,f, Liriope spicata (× 8 and 10), stamens separated g, h, Liriope Muscari (× 6 and 7). Measurements approximate only.

SYNOPSIS OF SOME OF THE KINDS OF LILY-TURFS OR LIRIOMONDOS

We are now ready for a systematic arrangement of the species under consideration. Two genera are accepted as cultivated plants for the purposes of this paper, contrasted in general as follows (see details in Fig. 9):

Flowers drooping, the perianth more or less attenuate or prolonged at base and bell-shaped or cylindrical, the ovary inferior (joined with the perianth); anthers long-pointed and more or less united about style which is straight or slightly curved (not bent), filaments very short or almost none..... MONDO (*Ophiopogon*)

Flowers erect or ascending or nearly sessile, the perianth rotate or wide open and not attenuate at base, two of the segms. usually more erect than the others, ovary superior and flattened or depressed on top and 3-lobed; anthers obtuse, not exceeding the filaments or even shorter than the filaments which, like the style, are usually bent in the middle..... LIRIOPE

MONDO, Adanson, Fam. Pl. ii, 496 (1763).

Ophiopogon, Ker-Gawl. Bot. Mag. t. 1063 (1808).

Flüggea, Rich. in Schrad. Neu. Journ. Bot. ii, 8, t. 1 A (1807), not Willd. 1805 (1806).

Slateria, Desv. in Journ. de Bot. i, 243 (1808).

Ovary and perianth joined (ovary inferior); ovary flat or depressed at top, 3-celled, ovules 2 in each cell: stamens attached on base of perianth-segments; anthers sharp-pointed, on very short filaments or practically sessile: flowers more or less drooping in racemes or loose spikes, one or few at each insertion and attended mostly by rather prominent acute bracts; perianth-base tapering to a short or long jointed pedicel: fruit single or as many as the cells, an oblong or ovoid 1-seeded berry. The pointed anthers on very short filaments readily distinguish the mondos, even on the herbarium sheet. Perhaps a score of species, two of which are well known to cultivation.

The grass-leaved species, or true mondos: leaves long-linear, mostly 1.5 cm. or less broad, without distinct petiole: plants without creeping over-ground stems.

Group Breviflorae: flowers broad and short, sessile or very short-pedicelled; perianth-base very short.

Plant dwarf, with very narrow short curved leaves, the scapes short and covered in the foliage: flowers hanging, light blue..... *M. japonicum*

FIG. 10. MONDO JAPONICUM, DWARF LILY-TURF.—Flowers, fruit, and habit of plant (in bloom).

Plant taller, often or usually 40-60 cm. or more, with leaves erect or at least not recurved, scapes prominent among the foliage.
Bracts in raceme subulate-pointed, twice or more exceeding fascicles of flowers..... *M. Wallichianum*
Bracts lanceolate or linear, not exceeding fascicles except perhaps the lowermost.
Scape 3-angled (triquetrous)..... *M. intermedium*
Scape plane or flat..... *M. planiscapum*
Group Longifloræ: flowers narrow or long, and very long-based, nodding or strongly divaricate on pedicels equalling or exceeding the perianth.
Perianth 10 mm. or less long to articulation, small and slender: leaves 2 mm. or less broad..... *M. n.sp.?*
Perianth 1.5 cm. long to articulation, large and bell-shaped: leaves 1 cm. or more broad..... *M. Jaburan*
The broad-leaved petiolate species (Mondopsis): leaves relatively short and wide, flat, to 5 cm. broad, narrowed into distinct petiole: plants with creeping and rooting more or less semi-scandent stems or caudices..... *M. dracænoides*

Mondo japonicum, Farwell, Amer. Midland Nat. vii, 42 (1921).
Convallaria Japonica, Thunb. Nov. Act. Reg. Soc. Upsal. iii, 208 (1780).
C. Japonica β, Thunb. Fl. Jap. 140 (1784).
C. cernua, Thunb. Mus. Nat. Acad. Upsal., xii, 97 (1792), *nomen nudum.*
Polygonastrum compressum, Moench, Meth. Pl. Suppl. 268 (1802).
Ophiopogon japonicus, Ker-Gawl. Bot. Mag. t. 1063 (1808).
Flüggea japonica, Rich. in Schrader, Neu. Journ, Bot. ii, pt. 1, 9 t. 1A (1807).
Slateria japonica, Desv. in Journ. de Bot. i, 244 (1808).
Mondo cernua, Koidz. Tokyo Bot. Mag. 332, xl (1926).

Sod-forming glabrous perennial, with long subterranean stolons, the slender somewhat cord-like profuse roots tuber-bearing, herbage dark green: leaves very many, rather stiff, mostly curved, 15-30 cm. long and 3-4 mm. broad, rather blunt at apex: scapes much shorter than the leaves and often overlooked in the matted foliage, 2-edged; flowers light lilac, 4-6 mm. across, 1-3 at each insertion, drooping in a short loose raceme that is often horizontal from the bending of the scape; perianth-base short and pedicel 4 mm. or less long: fruit size of a pea, blue, 7-10 mm. diam., consisting of a thin soft covering over a large pearl-white nearly globular seed, and persisting for months. Japan, Korea.

DWARF MONDO OR LILY-TURF (Figs. 2, 5, 9a, 10).—A pertinaceous grass-like ground-cover for temperate and tropical regions, often covering large areas in shade without blooming freely; excellent for edgings. It stands out-of-doors in protected places as far north as New York City.

FIG. 11. MONDO WALLICHIANUM.—Type specimen of Kunth's Flüggea Wallichiana; Berlin.

According to Ker-Gawler in Botanical Magazine (England), this plant was "introduced into Kew Gardens, by Mr. Graefer, in 1784. Blooms in June. A hardy greenhouse plant; we have no doubt but that it would grow in the open air full as well." The drawing in Botanical Magazine, t. 1063, "was made at the Nursery of Messrs. Gibbs, Old-Brompton." The plate represents the plant figured about one hundred years earlier by Kaempfer.

The account of N. A. Desvaux in Journal de Botanique (see p. 11), states that Slater, an English botanist and cultivator, was the first in Europe to grow the plant and that it bloomed with him for the first time in 1790.

† **Mondo Wallichianum,** n. tr.

Flüggea Wallichiana, Kunth. Enum. v, 303 (1850).

Ophiopogon Wallichianus, Hook. f. Fl. Brit. Ind. vi, 268 (1894), as to name only.

O. japonicus var. *Wallichianus*, Maxim. in Bull. Acad. Sci. St. Petersb., xv, 89 (1869-71); Mél. Biol. vii, 328 (1869-71), as to name.

Fluggea japonica var. *Wallichiana*, Baker in Journ. Linn. Soc. Bot. xvii, 501 (1879), as to name only.

Mondo japonicum var. *Wallichianum*, Farwell, Amer. Midland Nat. vii, 42 (1921), as to name.

Cespitose: lvs. narrow-linear, 5 mm. or less broad and to 40 cm. long and with slender apex, 9-nerved, margins slightly serrulate-scabrous, exceeding the compressed 2-edged erect scape which is about 30 cm. high: fls. about the size of those of *M. japonicum*, very short-pedicelled, in a few small remote fascicles, the bracts broad at base and subulate-acuminate and twice longer than the fascicle; perianth-segments narrowly ovate-oblong, obtuse, spreading or rotate, joined to ovary at base; filaments very short and anthers acute- mucronate. Differs from *M. japonicum* in the long leaves and scapes, the former 9-nerved and very slender-pointed, in the open flexuose raceme, and elongated setaceous bracts, as well as in stature; the root contrasts need study. India, but regions and range impossible to state without re-study of collections.

The above brief characterization is drawn from the original diagnosis of Kunth and the type specimen. It is necessary to go back to original sources because the species has been so much confused and misunderstood. Kunth founded his *Flüggea Wallichiana* on 5139b of Wallich's Catalogue, from Silhet (Assam), which he saw at Berlin ("in Herb. reg. Berol."); this specimen is still extant and through the courtesy of Der Director des Botanischen Gartens und Museums, Berlin-Dahlem, I am able to present an engraving of it (Fig. 11) made from a photograph. (The sheet was written *Flüggea Wallichii* but the name published *Wallichiana*). I

FIG. 12. MONDO INTERMEDIUM.—No. 5139A of the Wallich Catalogue, probable type or cotype (× nearly ½); Kew.

have not seen the true *M. Wallichianum* in cultivation, but it is so much confused with *M. intermedium* that I have felt under obligation to distinguish it.

Apparently another plant was in mind in Hooker's account of *Ophiopogon Wallichianus* in Flora of British India, vi, 268, as well as by Baker in Journal of the Linnean Society, xvii, 501. Hooker describes the flowers as nearly 1 inch in diameter, and bracts usually shorter than the flowers. He cites no. 5139A of the Wallich catalogue, but that plant is probably the type or cotype of *M. intermedium*, as we shall see. Baker writes of *Wallichianum* that the leaves are "3-6 poll. latis," but "3-6 lin." was probably intended and this would make it agree with Hooker's account; yet Kunth describes the leaves as "$1\frac{2}{3}$-$1\frac{3}{4}$ lin. lata," the measurement apparently having been exact. Knowing the customary conception of the species, one is impressed with the slenderness of the type specimen and receives a new impression from Kunth's "folia . . . anguste linearia, angustato-acutata" and "angustato-acutis," and "bractea . . . acuminato-subulata."

FIG. 13. MONDO PLANISCAPUM.—About one-half natural size.

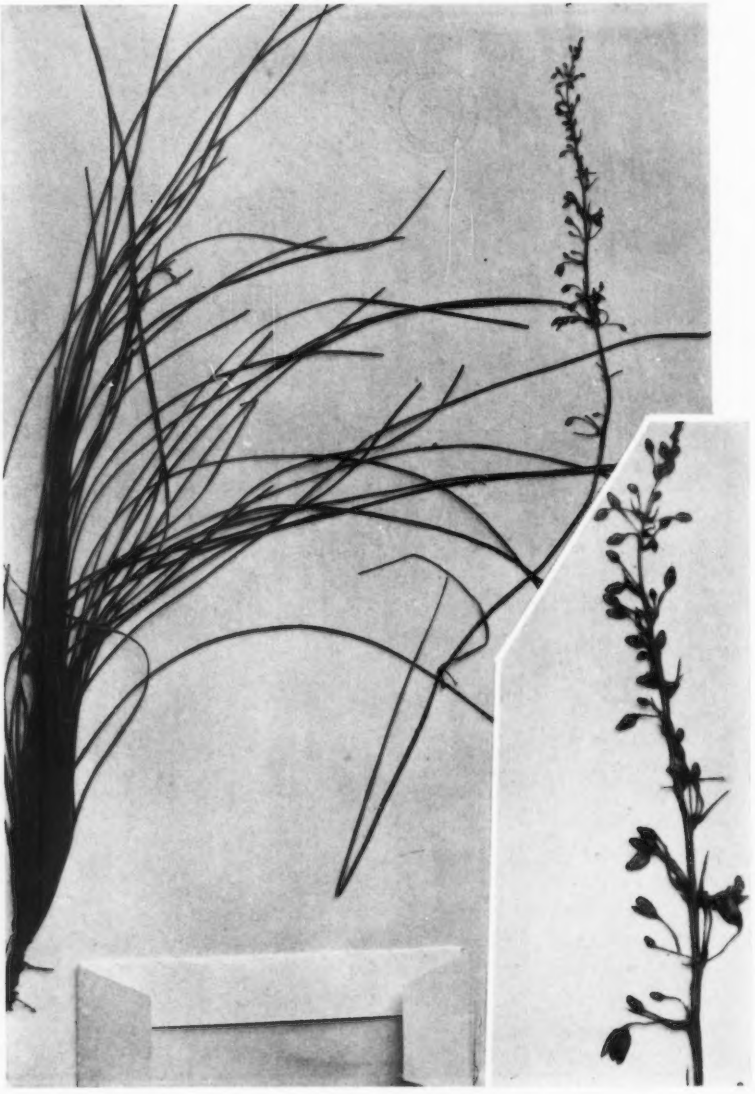


FIG. 14. MONDO from China, probably undescribed.—Nearly one-half natural size.

† **Mondo intermedium,** n. tr.

Ophiopogon intermedius, D. Don, Prodr. Fl. Nepal. 48 (1825); Royle, Bot. Himal. 384 t. 96 (1839).

Flüggea intermedia, Kunth. Enum. v, 306 (1850).

F. japonica var. *intermedia,* Schultes f. in Roem. & Sch. Syst. vii, 310 (1830).

Mondo japonicum var. *intermedium,* Farwell, Amer. Midland Nat. vii, 42 (1921), as to name.

Ophiopogon indicus, Wight, Ic. Pl. Ind. Or. vi, t. 2050 (1853).

As characterized by Don, the plant has strict linear obtuse leaves that are serrulate toward the base, scape triquetrous and half as long as leaves, raceme few-flowered, bracts linear and shorter than the flowers and with scabrous margins, the style equalling the perianth; *M. japonicum* differs in having recurved leaves, lanceolate bracts that surpass the flowers, style thick and shorter than perianth, the plant in all ways smaller. The species was described as from Nepal by Wallich; its further distribution, on the basis of new diagnoses, is yet to be determined.

It is not known whether the Wallichian specimens that Don had before him are in the Kew Herbarium or were part of the Lambert set of that distribution. The Lambert collection is now in the Delessert Herbarium in Geneva; Dr. John Briquet has kindly examined the Delessert for me and, while it contains Wallichian Ophiopogons, there are no specimens that bear marks inscribed by Don to indicate that they had been in his hands. Through the courtesy of the Director of the Royal Botanic Gardens I have the benefit of examinations made by Mr. C. Fischer, Assistant for India, of the Wallichian specimens at Kew, although none of the specimens is marked by Don. From the evidence there obtained, the details of which need not be entered here, it is probable that no. 5139A of the Wallich Catalogue is the type of Don's *O. intermedius,* and a photograph of the specimen is reproduced in Fig. 12. This is the number cited by Hooker as *O. Wallichianus,* but we have seen that *Wallichianus* was founded on another plant, 5139b. Hooker cites 5139C as *O. intermedius,* but the Herbarium discloses that that plant was received from Heyne and is probably from South India and certainly not from Nepal from which Don's plant came. It is apparent that these Indian Mondos require further attention.

I have not seen *M. intermedium* in cultivation in this country but have taken a plant under that name in England and apparently correct; it looks like a good subject for garden use.

† **Mondo planiscapum,** n. tr. Fig. 13.

Ophiopogon planiscapus, Nakai, Catalogus Seminum et Sporarum per annos 1919 et 1920 circa Tokyo et Nikko lectorum, Hort. Bot. Univ. Imp. Tokyo, 33 (1920).

O. japonicus var. *Wallichianus,* Maxim. in Bull. Acad. Sci. St. Petersb., xv, 89 (1869-71); Mél. Biol. vii, 328 (1869-71).

FIG. 15. JABURAN OR WHITE LILY-TURF.—Mondo Jaburan, about one-half natural size.

Similar to *M. intermedium*, and the relationship to be determined: it differs particularly, according to Nakai, in the more obtuse leaves, plane scape, and more fascicled flowers: rhizome long-creeping: leaves erect, 10-40 cm. long and 3-6 mm. broad, apex obtuse but perhaps mucronate, 7-9-nerved: scape 18-25 cm. long, complanate and somewhat winged; bracts broad-lanceolate, somewhat hyaline, 2-5 cm. long: flowers nodding, to 1 cm. broad, in a fasciculate raceme, light purple or white. Japan; apparently the far eastern representative of *M. intermedium;* perhaps some of the plants grown as *M. japonicum* are of this species. I have taken it in cultivation in China.

† **Mondo,** n. sp. ? Fig. 14.

Folia angustissima longissimaque, 2 mm. vel minus lata, tam longa quam scapus vel longiora: racemus flexuosus: flores parvi albidique, 6-10 mm. longa in pedunculo gracillimo 2 vel 3 in quoque nodo.

Leaves grass-like, long and very narrow, 30-45 cm. long, 1-2 mm. broad, canaliculate above, strongly keeled and veined underneath, rough on the edges: scape very slender, erect or the taller ones somewhat curved above, shorter than leaves or nearly equalling them, sharp-edged; raceme 8-16 cm. long, with 2 or 3 nodding flowers at each insertion: flowers small, whitish, perianth about 6-10 mm. long to the articulation, with a tapering very slender base; pedicels very slender, 8-15 mm. long and jointed midway; stamens opposite the segments, filaments evident but very short, anthers narrow and long-pointed; bracts nearly or quite as long as pedicels, very narrow almost acicular. Kuling, Province Kiangsi, China, coll. L. H. B., 1917, probably originally planted; also from Hupeh. Readily distinguished by the very slender habit and leaves, long slender many-flowered racemes, small flowers with long slender tapering base on long and thin pedicels.

Perhaps *Ophiopogon filiformis*, Léveillé in Bulletin de Géographie Botanique, xv, p. 25, no. 303 (1915) from the mountains of Yunnan should be considered in this connection, but the description of that species is so inadequate that no opinion can be ventured on it; yet my plant is not "foliis glaucis," as that plant is said to be. William Wright Smith, Regius Keeper of the Royal Botanic Garden, Edinburgh, where the Léveillé collections now are, has kindly had the specimen of *O. filiformis* examined and it seems to be much like the *M. Wallichianum* group: that group is characterized by short flowers, whereas the *Jaburan* set has a very different perianth character. Other species of Ophiopogon by Léveillé are also unidentifiable from the descriptions, and specimens of some of them have not yet been traced; these species should be understood before naming new ones from China, but in the meantime I am calling attention to the plant shown in Fig. 14.

† **Mondo Jaburan,** n. tr.

Convallaria Japonica α, Thunb. Fl. Jap. 139 (1784).
Slateria jaburan, Sieb. in Act. Bat. xii, 15 (1830).
Ophiopogon Jaburan, Lodd. Bot. Cab. xix, t. 1876 (1832).
Fluggea Jaburan, Kunth. Enum. v, 303 (1850).

FIG. 16. JABURAN OR WHITE LILY-TURF.—Flowers about natural size; fruit not quite full size, two of them double from one flower.

Cespitose perennial with a short erect stock and many stout cord-like roots, of which the heaviest are 3-4 mm. thick, with right-angled side roots, and no tubers: leaves stiffish and loosely erect, 30-90 cm. long, 1-1.5 cm. broad, flat, narrowed toward the apex but point narrowly blunt, midrib rather prominent above but secondary ribs rather obscure, under surface with 8-10 prominent veins or grooves and midrib scarcely distinguishable: scape much flattened and sharply 2-edged, nearly or quite equalling the leaves or sometimes slightly exceeding them: raceme 5-10 cm. long, simple, loose and open, the scape more or less bending with its weight: flowers white, nodding, 3-8 at an insertion and the bracts green with broad white-hyaline margins and the lowest one sometimes 5 cm. long, pedicels 1-1.5 cm. long and white; perianth-part 1.5 cm. long from the articulation at middle of pedicel, the tubular or basal part of it long and narrow, segments lance-linear, 8-10 mm. long: fruit oblong, 1-1.4 cm. long, sometimes 2 or 3 berries on the same pedicel, deep violet-blue; seed pearly-white, nearly filling the drupe. Japan, in woods.

JABURAN. WHITE MONDO OR LILY-TURF (Figs. 3, 4, 9c and d, 15, 16).—A striking plant, grown somewhat under glass, and in the open in the southern states and California, the range of hardiness yet to be determined. Sometimes the leaves are faintly lined in lighter green. A form with variegated or prominently striped leaves is † var. **vittata**, but apparently most of the plants thus named are the striped-leaved form of *Liriope Muscari*, as that species often passes as *Ophiopogon Jaburan*, but even when not in flower the liriope is distinguished from Jaburan by under surface of leaves showing prominent midrib and by the fine roots and the presence of oblong tubers.

Loddiges and Sons, picturing the plant in 1832 in the Botanical Cabinet, published in London, state it "was obtained by us from the Leyden garden, in 1830, with the name of Slateria Jaburan." They write that "it will thrive very well in the greenhouse (even perhaps out of doors)".

This species is sometimes known in cultivation as *Dianella intermedia*. The plant commonly grown in pots as *Ophiopogon Jaburan* is *Liriope Muscari*.

According to the Somoku-Dzusetsu by Iinuma and Makino (Vol.ii, 6, pl. xliv) the name Yabu-ran is applied in Japan to what is there called *Liriope graminifolia*.

The customary reference to *Slateria jaburan*, Sieb. in Act. Bat. is in full: Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen, xii, p. 15. It is only a name in Siebold's list, "Synopsis Plantarum Œconomicarum Universi Regni Japonici," and the only means of identifying the name are by the entry of the Japanese vernacular Jaburan and by this line: "*Synon:* Convallaria Japon. Th. variet. major." The citation of Thunberg's *major*, that is, his *Convallaria Japonica* α, connects it with the plant now under consideration and saves *Slateria Jaburan* from being a *nomen nudum*.

FIG. 17. CREEPING LILY-TURF.—Liriope spicata, about natural size; four fruits are borne on a single pedicel.

Mondo dracænoides, Farwell, Amer. Midland Nat. vii, 42 (1921).
Fluggea dracænoides, Baker, Trimen's Journ. Bot. 1874, 174.
Ophiopogon dracænoides, Hook. f., in Fl. Brit. Ind. vi, 268 (1892).

Stems prostrate and subscandent, rooting, more or less ligneous, scarious-sheathed: leaves oblong-lanceolate, acuminate, finely nerved, 8-15 cm. long and 2-4 cm. broad, petiole 2-6 cm. long: scape (with raceme) about equalling the leaves, with small lanceolate bracts shorter than the white or pale lilac solitary or fascicled nodding flowers. Sikkim and Khasia Hills, India, at considerable altitudes.

I have not met with this plant in cultivation, but it seems to have been confused with *Reineckia carnea,* a Japanese and Chinese plant that has long been cultivated but which is at once distinguished by its pinkish or flesh-colored flowers with long segments becoming reflexed. Plants from China referred to *M. dracænoides* are likely to be *M. clavatum,* Farwell, l.c. (*Ophiopogon clavatus,* Wright, Kew Bull. 1895, 116).

This group of mondos is so unlike the grass-leaved species in habit and character as to raise the question whether it is not generically distinct.

LIRIOPE, Loureiro, Fl. Cochin. 200 (1790)

Ovary superior, flattened or furrowed on top, 3-lobed, cells 2-ovuled: stamens more or less hypogenous, at least inserted under the ovary; anthers obtuse, emarginate; filaments about the length of the anthers or a little exceeding them: flowers erect or ascending or nearly sessile, in erect spikes or spicate racemes, few to several at each insertion and the pedicels subtended by short scarious mostly obtuse bracts, the common or foliar bract (particularly at base of spike) more prominent and acute; joint in pedicel very close to the perianth, which is obtuse or shouldered at base: fruit single or as many as the cells, a globular or ovoid 1-seeded berry. The blunt anthers on long filaments easily mark the liriopes from the mondos. Perhaps only three or four species, two of which are well known in cultivation.

Before proceeding with an account of the liriopes I shall mention the case of *L. graminifolia,* to which the common species have been referred. This name begins as *Asparagus graminifolius,* Linn. Sp. Pl. ed. 2, 450 (1762), and the transfer to *Dracæna graminifolia,* Linn. Syst. Nat. ed. 12, 246 (1767). This name was brought up as *Liriope graminifolia,* Baker, Journ. Linn. Soc. Bot. xiv, 538 (1875), and xvii, 499 (1879) excl. descr.; and it is made *Mondo graminifolia,* Koidz. Tokyo Bot. Mag. xl, 333 (1926); this makes the Linnaean plant identical with the *Liriope spicata* of eastern Asia. It is to be noted, however, that Linnaeus writes "habitat in Asia" and not specifically in Japan or China, and this of itself raises a suspicion. The Linnean Society of London has supplied me with a photograph of the plant, the sheet written "graminifolius" by Linnaeus. It is a true

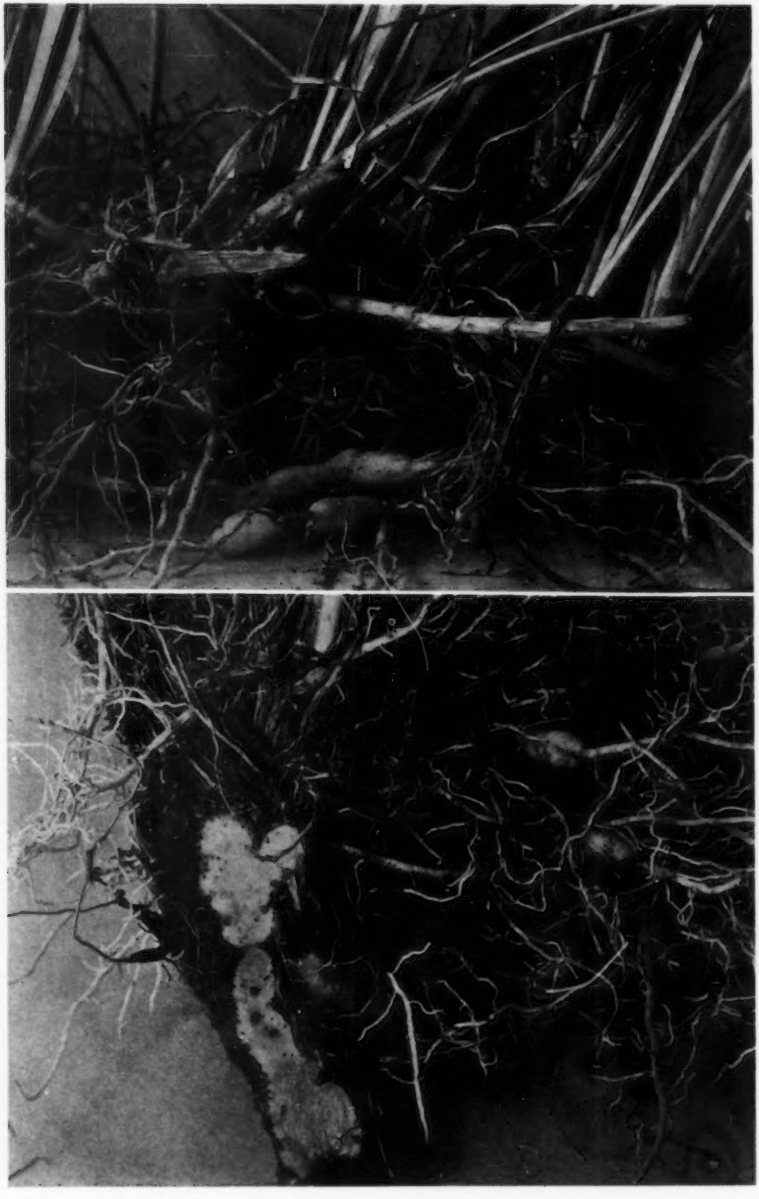


FIG. 18. ROOT-SYSTEMS IN LIRIOPE.—Upper, Liriope spicata; lower, L. Muscari.

Liriope, a narrow-leaved plant with long open raceme of prominently pedicelled very small flowers, and is not the same as the plants of Loureiro and Thunberg (Figs. 6 and 7). It has much the look at first glance of *Mondo n. sp.* p. 27. Moreover, I have a specimen from Kashmir (R. R. Stewart 3032) that seems to be the same as that of Linnaeus. I therefore keep the plant separate until further evidence accumulates, and it is not treated in this paper.

Leaves narrow, mostly about 5 or 6 mm. broad, very grass-like: flowers very light lilac to almost white, in a very open spike: root-system shallow and fibrous, tuber-bearing with long slender stolons.... *L. spicata*

Leaves broader and stiffer: flowers dark (lilac-purple or "blue") in denser and often very dense spikes: root-system an upright stock with mat of side roots and few tubers..... *L. Muscari*

Liriope spicata, Lour. Fl. Cochin. 201 (1790).
Ophiopogon spicatus, Lodd. Bot. Cab. t. 694 (1822).
O. longifolius, Decne. Fl. des Ser. xvii, 182 (1868).
Liriope spicata var. *minor,* C. H. Wright, Journ. Linn. Soc. Bot. xxxvi, 80 (1905).

Cespitose glabrous perennial with slender parts: root-system shallow, mostly horizontal with many long slender jointed rootstocks just underneath the surface, and with slender roots bearing many tubers that are not very thick and which tend to look jointed or almost moniliform: leaves flexuose and very grass-like, mostly distinctly longer than the slender scapes, 3-8 mm. broad (mostly about 5 or 6 mm.), few-nerved, midrib prominent underneath, mostly tapering to apex: raceme or spike 3-6 or 10 cm. long, bearing 5-9 whorls or insertions of 2-4 fls. (mostly 3) each: flowers very light lilac to almost white, 4-6 mm. across; style and filaments commonly up-bent at middle; bracts short and scarious, subtending the small close clusters of very short-pedicelled flowers: fruit globose, at first with faint bloom but becoming black, about 7 mm. diam.; seed globular, filling nearly all the space. Japan, China and Cochin-China.

CREEPING LIRIOPE OR LILY-TURF (Figs. 6, 8, 9e and f, 17, 18).—Cultivated in this country but apparently less common than the next species. On the herbarium sheet the specimens, without the root-system and the flower-color, may be difficult to distinguish from forms of *L. Muscari,* but the two appear to be distinct and are readily separated by cultivators. The root-system is much like that of *Mondo japonicum,* the long slender rootstocks causing it to come up almost anywhere.

The specimen of Loureiro's *L. spicata,* now in Paris (see p. 13), is shown half size in Fig. 6; the flowers are missing, but the identity of the plant seems to be clear from the lax open inflorescence, short bracts and narrow long-tapering grass-like leaves.

I have included Loddiges' plate (t. 694) of *Ophiopogon spicatus,* Botanical Cabinet, (Fig. 8), in this species notwithstanding that the plate is

FIG. 19. BIG BLUE LILY-TURF, LIRIOPE MUSCARI.—Type specimen of Ophiopogon Muscari, about one-half natural size; Paris.

cited by Maximowicz as his *O. spicatus* var. *minor* (Mél. Biol. vii, 324, 1869-71). This plant is transferred by Baker to *Liriope graminifolia* var. *minor* (Journ. Linn. Soc. Bot. xvii, 500, 1880), by Wright to *Liriope spicata* var *minor* (Journ. Linn. Soc. Bot. xxxvi, 80, 1903), and by Makino it is elevated to *Liriope minor* (Tokyo Bot. Mag. vii, 323, 1893. See also Tokyo Bot. Mag. xv, 93, 1901). Koidzumi refers *Liriope minor*, Makino, to his *Mondo cernua*. I do not pass on the question of the existence of a tenable variety or species of this diagnosis (*minor*).

I have not been able to understand the *spicata* varieties of Maximowicz from the material at my disposal.

Fortunately the specimens of Decaisne's *Ophiopogon longifolius* and *O. Muscari* (1868) are preserved at the Jardin des Plantes, Paris, and through the kindness of M. Lecomte I have photographs of them, one of which is reproduced here (Fig. 19).

† **Liriope Muscari,** n. tr.

Ophiopogon Muscari, Decne. Fl. des Ser. xvii, 181 (1868).

Ophiopogon spicatus, Hook. Bot. Mag. t. 5348 (1862).

Liriope graminifolia var. *densiflora*, Baker, Journ. Linn. Soc. Bot. xvii, 500 (1879).

L. spicata var. *densiflorá*, C. H. Wright, Journ. Linn. Soc. Bot. xxxvi, 79 (1905).

Cespitose glabrous rather heavy or stiff perennial: root-system of a straight upright stock or root-crown, or a clump of stocks, 5-8 cm. long, and matted roots with a downward direction, the tubers thick and not jointed: leaves stiffer and darker green then in *L. spicata* but limp and soft to the hands as compared to *Mondo Jaburan*, little or not at all exceeding the stiff more or less flattened scapes, the characteristic ones 8-12 and sometimes 26 mm. broad, strongly several-nerved, midrib prominent underneath, the point abrupt or blunt: raceme or spike 3-24 cm. long, dense, the whorls contiguous and flowers 4-7 or more at each insertion and sometimes a dozen or more on a peduncle (spike somewhat compound), rachis often much flattened and frequently fasciated; bracts more or less herbaceous and often 6-10 cm. long and sometimes growing on the surviving scape after flowers and fruits have fallen: flowers lilac-purple ("deep blue"), 5-8 mm. across, mostly in 10 or more whorls or insertions, the style and filaments up-bent at middle: fruit shining black, globose, 5-8 mm. diameter, long-persisting. Japan and China, but probably the very large-spiked, fasciated and cockscombed forms are the result of cultivation.

BIG BLUE LIRIOPE OR LILY-TURF (Figs. 1, 9g and h, 18, 19, 20).—This plant is common as a pot subject in greenhouses and conservatories, and is hardy in the open in the North; frequently known and sold as *Ophiopogon Jaburan*. A form with yellow-striped leaves † (var. **variegata**) is very decorative.

FIG. 20. LIRIOPE MUSCARI, the BIG BLUE LILY-TURF.—Inset left, fruit natural size, black. Inset right, a short-headed form.

The record made by Ker-Gawler in Botanical Register, 1821 (England), is that the plant "was introduced last year by the Horticultural Society. Flowered in their conservatory at Hammersmith in October."

It is a striking plant, probably the best of the liriopes for planting.

This is the *Ophiopogon spicatus* var. *communis*, Maxim. (Bull. Acad. St. Petersb. xv, 85, 1870-1) so far as the citation of Bot. Mag. t. 5348 is concerned, but the diagnosis does not describe the plant here intended; nor am I able to satisfy myself as to what is meant by var. *Kunthianus*, Maxim.; therefore I cite neither one of these varieties in the synonymy.

Slateria repens, Sieb. Act. Bat. (Bataviaasch Genootschap Kunst. Wetensch. Verh.) xii, 15 (1830) is doubtful.

† **Liriope Muscari** var. **exiliflora,** nom. nov. Fig. 7.
Convallaria spicata, Thunb. Fl. Jap. 141 (1784).

SMALL BLUE LIRIOPE OR LILY-TURF. A more slender form: leaves often only 6 mm. broad but sometimes nearly twice as broad: spike open (not crowded), the whorls or insertions being well separated: flowers 2-4 (prevailingly 3) at each insertion: bracts small, seldom foliaceous. Japan and China, and not infrequent in cultivation.

FIG. 21. CONTRASTS OF DIERVILLA AND WEIGELA.—a, b, Diervilla Lonicera, flowers and fruits,—above *b* is seen the characteristic group of 3, the primary or middle fruit sessile; c, Weigela japonica group as known in cultivation; d, e, Weigela florida group, flowers and fruits.

ARTICLE 2. THE CASE OF DIERVILLA AND WEIGELA

A DISCUSSION OF BUSH-HONEYSUCKLES AND WEIGELAS IN THE INTEREST OF THE CULTIVATOR

In Britton and Brown's Illustrated Flora of the Northern United States and Canada it is stated under Diervilla that "the Japanese and Chinese *Weigelas*, often referred to this genus, are here regarded as distinct." The statement is repeated in the second edition in 1913. This opinion on the Weigelas I have resisted, desiring not to multiply genera or to break with tradition, and in my writing on the plants have followed the customary combination treatment albeit with growing doubts as to its validity. I am now convinced that on morphological, distributional and probably phylogenetic grounds the occidental and oriental plants should be regarded as generically distinct. This separation accords well with the settled conviction of growers, who know that Diervilla and Weigela represent quite different habits and utilities. Nurserymen habitually list Weigelas, a practice properly sanctioned by the recent Standardized Plant Names.

The genus Diervilla begins with Tournefort in 1706, before the time of binomial nomenclature, in his "Suite de l'establissement de quelques noveaux genres de plantes" (in Histoire de l'Academie Royale des Sciences, p. 106, otherwise cited as Act. Acad. Par.), with description and figures. He knew but one species, "D. Acadiensis, fruitcosa, flore luteo" of North America. Linnaeus, 1753, referred the plant to Lonicera as *L. Diervilla*, although he had previously accepted the genus, but noted the species as "Loniceris valde affinis." Under the rules of nomenclature the accepted botanical or generic name begins with Philip Miller in his abridged Gardeners Dictionary, 1754, although it has been dated from Adanson in 1763, both of whom founded the genus on Tournefort. It is taken up again by Philip Miller in the eighth edition of The Gardeners Dictionary, 1768, and with this publication begins the first acceptable binomial, *Diervilla Lonicera*, with a regular citation of Tournefort, thus perpetuating in the name the affinity with the honeysuckles. Miller knew only the single North American plant. No other species was added until Buckley's *D. sessilifolia* in 1843; and Gattinger's *D. rivularis* was published in 1888, completing the genus as now understood with three species of eastern North America.

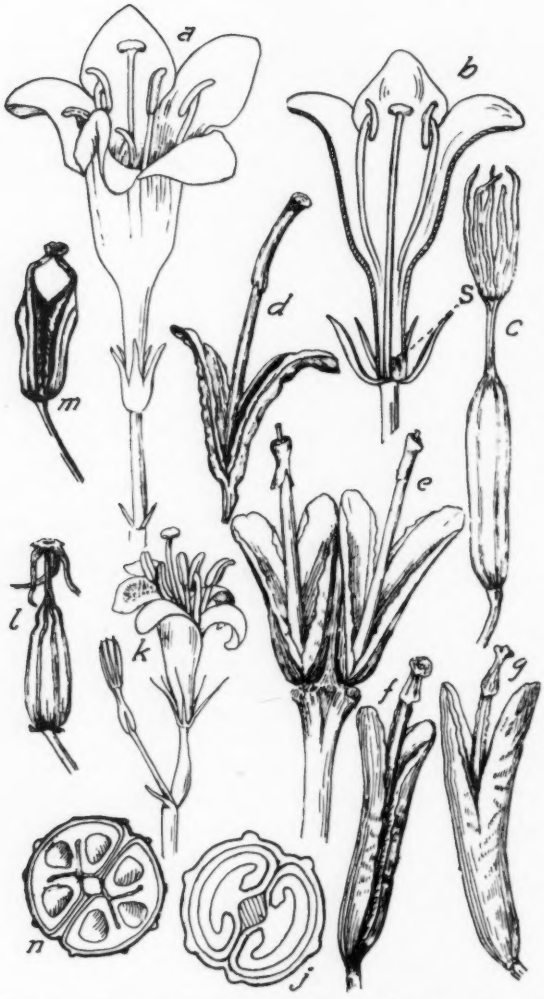


FIG. 22. DIERVILLA AND WEIGELA.—a, flower outline of Weigela florida group; b, longitudinal section of Weigela, showing gland at S; c, d, young and mature fruit of the W. florida group; e, f, g, fruits of other weigelas; k, l, flower and fruit of Diervilla Lonicera; m, fruit of D. sessilifolia, an occasional state of dehiscence; j, diagrammatic cross-section of fruit of Weigela, showing column or solid central core; n, diagrammatic section of fruit of Diervilla, with hollow center and false partitions on sides that sometimes appear. All enlarged.

The genus Weigela was founded by Thunberg in 1780 with one species, *W. japonica*. The plants were known to Kaempfer who wrote of them in 1712 as Utsugi (Amoenitatum Exoticarum) and described three kinds, to which publication Thunberg refers but does not separate them. In 1794 Thunberg added a second species, *W. coræensis*. The names indicate the countries. In 1832 the genus Calysphyrum was established by Bunge, but perhaps not published until 1835, and one species, *C. floridum*, was described, a plant cultivated in China. Bunge apparently did not know Thunberg's Weigela, and Calysphyrum is now by common consent referred to that genus. At present nine or ten species of Weigela are known, all of eastern Asia.

There was much misunderstanding of the morphology of Weigela by the early botanists and consequently considerable doubt as to its proper family when the natural system of classification began to gain headway. Alphonse DeCandolle as late as 1839 placed the genus in Caprifoliaceæ where it now remains. The difficulty arose in part because Thunberg mistook the gland in the bottom of the corolla for an ovary and described it a "germen superum," with the style arising at its base. He did not know the fruit; the statement, "fructus adhuc ignotus," appears in the original description, in Flora Japonica, and in his pupil Hornstedt's Dissertation (Dissertationes Academicae Upsaliae Habitae, 1799 but paper dated 1781). The long inferior ovary was therefore regarded as a pedicel or peduncle. Even when Bunge founded his genus Calysphyrum in 1832 he placed a question mark after "capsula"; however, he speaks of the ovary as included within the calyx-tube and the calyx-tube as adnate to the ovary, and his generic name indicates the likeness of the calyx (ovary) to a peduncle,—"nomen a calyce pedunculum simulante." To the casual observer the elongated inferior ovary may well be mistaken for a flower-stem.

The eminent Robert Brown considered Weigela to be referable to Diervilla, although he evidently did not have complete material on which to found the opinion; but so great was his influence that this disposition of the Weigelas became current and holds to this day, although in the meantime the treatment has not been uniform even on the part of the same author. Thus Carrière treats them all as Diervilla in his account of the known species in 1853 (in Revue Horticole) but subsequently describes new kinds under Weigela. In Endlicher's Genera Plantarum, 1836-1840, Weigela is referred to Diervilla on the citation of Robert Brown.

The elder DeCandolle united the two genera in the fourth volume of the Prodromus, 1830; but the younger DeCandolle writes in 1839, in the paper to which we have referred, that a definite disposition cannot be made until ripe fruits of Weigela are available. As we have seen, Thunberg does not describe or illustrate fruits of Weigela, nor does Aug. P. DeCandolle

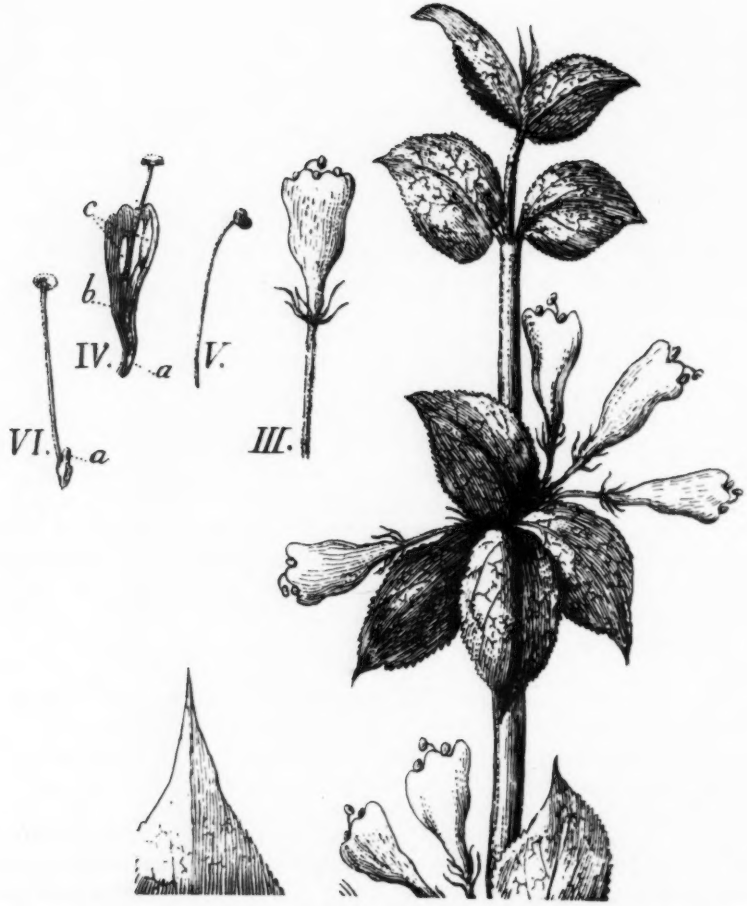


FIG. 23. WEIGELA JAPONICA, part of the picture published by Thunberg in 1780. At *a* in IV and VI is indicated the gland mistaken for an ovary.

mention them in the Prodromus. Siebold and Zuccarini write of *Diervilla japonica (versicolor)* in 1835, "capsula desideratur." It seems, therefore, that the union of Diervilla and Weigela was made without knowledge of the characters that best distinguish them.

Alphonse DeCandolle in his paper in 1839 (Annales des Sciences Naturelles) is not satisfied with the former disposition and holds the two genera apart although he had not seen mature capsules of Weigela. In describing *W. florida* he writes "fructus ignotus." One is struck by the absense of delineation of fruit in many portraits of Weigela that have appeared through the years.

The morphological differences between Diervilla and Weigela began to be emphasized when the mature fruits of the two were available, and a discussion of the question was read by C. A. Meyer in November, 1854, and published the following year in Bulletin de la Classe Physico-Mathématique de l'Académie Impériale de Sciences de St. Pétersbourg (xiii, 216-219), with the separation of genera. The studies by Trautvetter and Meyer resulted in the founding of a third genus, Calyptrostigma, characterized by good floral and capsular characters. This genus is commonly dated from 1847, Florula Ochotensis Phaenogama by E. R. v. Trautvetter und C. A. Meyer in Middendorff's Reise in den Ausserten Norden und Osten Siberiens, I, Theil 2, although the general work is dated 1856. This paper is undoubtedly to be taken as the original publication of the genus since the authors write *nob.* after the name; when the name is taken up again (Bull. Acad. Petersb. xiii, 220) it is attributed to *Traut. et Mey.:* this latter publication bears the date 1847, although the paper itself as it appears in the publication is dated 1854. There is an older Calyptrostigma of Klotzsch, 1844, of the Euphorbiaceæ; this is a synonym of Beyeria, although the two names are apparently of the same year, and is so held as a synonym by the latest monographer (Grüning in Das Pflanzenreich, iv, 147); the name of Klotzsch is safely buried and under the International Rules of Nomenclature does not invalidate the Calyptrostigma of Trautvetter & Meyer, since a name may not be changed or modified "because of the existence of an earlier homonym which is universally regarded as nonvalid." Of Calyptrostigma there are now two well accepted species.

The distinctions between Diervilla and Weigela are several and important. The genera do not seem to be very closely related The main differences are in stature and habit, mode of flower-bearing, character of flowers, and particularly in the fruit.

It is important to take pains to identify the *Weigela japonica* of Thunberg. In his original Beskrifning in 1780 (Kongl. Vetenskaps Academiens nya Handlingar, i) he has an illustration, part of which is reproduced later (1784) in his Flora Japonica. Most of this picture is presented in Fig. 23. It is a crude picture ("icone valde rudi," write Siebold and Zuccarini

in their Flora Japonica), but nevertheless it gives the essential features. One is struck with the odd form of the corolla. The type specimen preserved at Upsala (Fig. 24), the photograph of which is kindly supplied me by Dr. O. Juel, undoubtedly explains the case. The picture was probably made from the dried specimen, the upper whorl suggesting the main cluster shown in Fig. 23; the flowers are misshapen by the pressing and drying, as other shapely flowers and buds on the specimen testify. In his descriptions of Weigela, and also in Hornstedt's, the corolla is funnel-shaped (infundibuliform). In his accounts of 1780 and 1784 Thunberg speaks of the leaves as petiolate and describes the petioles; but in his account of *W. japonica* in 1794 (Trans. Linn. Soc. ii, 331) he says the leaves are sessile and petiole none. Subsequent writings have recorded the leaves as densely pubescent underneath, but Thunberg twice states that they are glabrous but hairy on veins on both surfaces. Siebold and Zuccarini substitute the new name *versicolor* (*Diervilla versicolor*) for *japonica*, a practice not unlawful at that time, and state that the corolla-tube is clavate and straight, and that the leaves are short-petiolate, and "utrinque pubescentia et superne scabriuscula"; their beautiful illustration, a piece of which is reproduced in Fig. 26, shows funnelform corollas. It is difficult to interpret *W. japonica*, as the differing opinions of various writers attest. Thus Sargent, after seeing plants in the wild in Japan, recognized but a single species and would refer *D. grandiflora* and *D. floribunda* to *D. japonica* (Garden and Forest, ix, 404). *W. japonica* is clearly differentiated by Rehder in Mitteilungen der Deutschen Dendrologischen Gesellschaft, no. 22, 1913, pp. 264-265, on the basis of a photograph of the type specimen. Nakai also makes a critical definition of this species in Tentamen Systematis Caprifoliacearum Japonicarum, p. 118, in the Journal of the College of Science, Imperial University of Tokyo, 1921.

The characters of pubescence on leaves and twigs are difficult to apply in cultivated plants of Weigela, and one is not warranted in assuming, without supporting evidence, that these plants are hybrids; this situation raises the question whether the differences in pubescence and hairiness will not be found to be inconstant and indefinite in nature if one can test the question with abundant specimens representing wide ranges of conditions.

In the following pages many of the cultivated plants are referred to as belonging to certain groups rather than to species, as their relationships are not always clear.

Explanation:—A dagger (†) is placed before new binomials and combinations for the convenience of the bibliographer. The abbreviation n. tr. means new transfer. (See Gent. Herb. i, p. 8).

THE GENERA AND SPECIES

It is not within the purview of this paper to attempt a monograph of the Diervilla-Weigela group, nor to make a morphological study. The most that is here intended is to account for kinds in cultivation and thereby to indicate enough of the gross characters to show the evident differences and to suggest the main lines of a method of treatment. It is only in the case of *Weigela japonica* that I have thought it necessary to consult a type specimen; there is no doubt as to the type of Diervilla, but the case of Weigela has not been so clear. Probably it will be some time yet before conclusions can be reached on the Japonica group, particularly as represented in cultivation. We should recognize two and probably three genera, on the lines of demarcation of former able authors; and some of the contrats are as follows:

Diervilla. BUSH-HONEYSUCKLES. Low shrubs forming colonies, spreading extensively by horizontal roots and subterranean stems: inflorescence terminal or subterminal on axial growths of the season, the terminal or central flower when in 3's sessile and thrown to one side in fruit: corolla small, Lonicera-like, more or less distinctly bilabiate, honey-yellow or greenish-yellow, not showy, anthers and style prominent: capsule thin-walled, turgid below and tapering to long beak on which the spreading subulate calyx-lobes are long persistent, indehiscent or tardily and imperfectly so by splitting on the sides above and the valves not separating, without a persisting central column, the core hollow at maturity; seeds minutely reticulate, not winged. Three species in Eastern North America. Figs. 21, 22 k, l, m, n. Although all the species are more or less planted, they are not strictly horticultural plants; they are not of sufficient appeal and have not varied enough to have received garden varietal names.

Weigela. WEIGELAS. Tall erect shrubs not stoloniferous: Main inflorescence from last year twigs and mostly on short lateral shoots (often terminal on new axial growths late in the season, the so-called "second bloom"), the flowers and later the fruits collateral: corolla large, brilliant and commanding, not Lonicera-like, not bilabiate although lobes perhaps unequal, mostly in ranges of pink, purplish or carmine, anthers commonly not protruded but style sometimes exserted: capsule thick-walled and ligneous, linear or narrow-cylindrical, the projected beak consisting of a durable central column from which the 2 valves separate and open from their apex, the erect more or less herbaceous calyx-lobes not long persistent; seeds angular, often winged. Nine or ten recognized species in Eastern Asia (the described *D. fallax* of Java being doubtful). Figs. 21, 22 a, b, c, d, e, f, g, j. These plants are prime horticultural favorites for the showy bloom, with many named garden varieties. Four types are represented mostly in gardens, *W. florida*, *W. præcox*, *W. japonica*, *W. floribunda*.

Calyptrostigma. Erect early-flowering shrubs differing from the preceding genera chiefly in the markedly irregular and odd 2-lipped calyx, pilose anthers connected in a ring about the style, calyptrate or hooded stigma, broad capsule without a persisting projecting central

column and dehiscing at the apex (disclosing the weak included column) but the valves commonly held for some time at their tips, deciduous calyx-lobes, scobiform linear-oblong and plano-compressed seeds: flowers apparently terminal on annual axial growth as well as lateral.—At least two species in Eastern Asia. Fig. 25; and the student may see similar fruits displayed in Botanical Magazine t. 7876, and in Baillon's Natural History of Plants, vii, fig. 357. These plants are little known in cultivation, as they are usually rather difficult to grow. They are not further treated in this paper.

DIERVILLA, Miller, Gard. Dict. Abridged, Ed. 4, 1754.

* Branchlets and leaves glabrous or practically so.

+ Leaves prominently petiolate; margins distinctly ciliate: clusters few-flowered.

1. **Diervilla Lonicera,** Mill. Gard. Dict. Ed. 8 (1768).
Lonicera Diervilla, Linn. Sp. Pl. 175 (1753).
Diervilla trifida, Moench, Method. Plant. 492 (1794).
Diervilla Tourneforti, Michx. Fl. Bor. Am. i, 107 (1803).
Diervilla humilis, Pers. Syn. Pl. i, 214 (1805).
Diervilla canadensis, Willd. Hort. Berol. i, 222 (1806).
Diervilla lutea, Pursh, Fl. Am. Sept. i, 162 (1814).
Diervilla Diervilla, MacM., Bull. Torr. Club, xix, 15 (1892).

Fig. 24. Weigela japonica.—Type specimen of Thunberg, Upsala. Nearly two-thirds natural size.

Shrub 3-10 dm. high, spreading extensively by means of long shallow horizontal roots and rootstocks, glabrous or nearly so except the ciliate leaf-margins and inside and perhaps outside of corolla, branches nearly terete: leaves with short but prominent petioles, ovate-oblong to ovate, to 10 cm. long, subcordate or rounded to broad-cuneate at base, long-acuminate, closely serrate: flowers terminal or in upper axils of leafy shoots of the season; lower axillary peduncles often single-flowered, but most of them about 3-flowered and the central or early flower (when the cluster is normally developed) commonly sessile and the lateral ones pedicelled; calyx divided to base into 5 linear-subulate lobes 3-4 mm. long; corolla 12-18 mm. long, light-yellow, 2-lipped, the narrow lobes shorter than the tube; anthers linear and attached near the base, projecting beyond the throat, filaments bearded; stigma capitate on exserted style: capsule remaining the second year in a practically indehiscent state, 10-15 mm. long, part of which is the very slender beak on the tip of which the spreading calyx-lobes long persist, the thick body thin-walled and lightly ribbed; seeds glossy, angular-globular and minutely reticulated.—Banks and rocky places, Newfoundland to Saskatchewan and southward to North Carolina.

FIG. 25. FRUITS OF CALYPTROSTIGMA.

The name *Diervilla acadiensis* has been used for this species (e.g. Baillon Natural History of Plants, vii, fig. 356). This name is accredited in indexes to Duhamel, making it the earliest publication; but that author quoted the polynomial of Tournefort and cited him, and did not propose a binomial. I do not know that it has ever been published in such a way as to constitute a tenable binomial.

++ Leaves sessile or essentially so; margins little if at all ciliate: clusters several- to many-flowered.

2. **Diervilla sessilifolia**, Buckley in Amer. Journ. Sci. xlv, 174 (1843).

Plant rather bigger with larger nearly or quite sessile leaves which are very long-tapering and light-colored underneath: flowers more numerous and forming dense terminal and upper-axillary clusters: capsule less tapering, more likely to dehisc, some of them sessile along the axis of the peduncle-branches.—Mountains of North Carolina, Tennessee and Georgia; credited also to Alabama but not confidently admitted by the latest list (Roland M. Harper, Catalogue of the Trees, Shrubs and Vines of Alabama. 1928); hardy in northern states.

D. splendens, Kirchn. in Petzold & Kirchner, Arboretum Muscaviense 442, No. 1560, 1864 (*Weigela splendens*, Carr. in Fl. des Serres, viii, 292 1852-3) is very like *D. sessilifolia* and sometimes referred to it, except that leaves are very short-petioled; a garden plant, said to be a hybrid between *D. sessilifolia* and *D. Lonicera*.

** Branchlets and leaves markedly pubescent: petioles very short or almost wanting: clusters several- to many-flowered.

3. **Diervilla rivularis,** Gattinger, Bot. Gaz. xiii, 191 (1888).

Stout bush to 2 m., grayish-pubescent in most of its parts: flowers numerous in terminal and subterminal clusters: capsule much as in *D. sessilifolia* but hairy-pubescent, sessile along the peduncle-branches except the last laterals.—Mountains and highlands, North Carolina, Tennessee, Georgia, Alabama; hardy in northern states.

WEIGELA, Thunb., Vetens. Acad. Handl. 137, 1780.

§ 1. UTSUGIA, A. DC., Ann. Sci. Nat. ser. II, xi, 240 (1839). Calyx divided to the base, the lobes very narrow (linear), usually prominently ciliate (note all the parts in Fig. 26): fruit sometimes hairy; seeds variously winged.

* Leaves (at least underneath), exterior of corolla-tube, young growths, variously hairy or pubescent.

+– Fruit glabrous (unless in var.): corolla only lightly hairy to nearly glabrous outside.

++ Corolla-tube broad-clavate (gradually widening upwards, except in var. *sinica*), color of flowers light, mostly pink, rose or white, versicolorous (changing with age).

1. **Weigela japonica,** Thunb. in Vetens. Acad. Handl. 1780, 137, t. 5; Fl. Jap. 90 (1784).
Diervilla japonica, DC. Prodr. iv, 330 (1830).

Shrub 2-3 m. high, young parts with lines of hairs or glabrous: leaves short-petioled, elliptic, ovate or somewhat obovate, acuminate or cuspidate, serrate, soft-canescent underneath, at least on rib and veins, the nerves prominent: flowers mostly 3 on a very short peduncle; calyx-lobes very narrow, separate to base, hairy; corolla funnelform, with clavate tube and narrow-bell-shaped upper part, 2-3 cm. long, greenish or whitish at first and becoming light carmine, pubescent, the lobes nearly equal and obtuse; style described as exserted: capsule presumably nearly or quite glabrous and seeds winged.—Mountains of Japan.

The case of *Diervilla versicolor*, considered by Siebold and Zuccarini to be the same as *W. japonica*, is not resolved here; they did not have fruit. Rehder and Makino independently consider it a variety of *floribunda*, in which they are followed by Schneider; flowers greenish at first, leaves pilose on veins underneath; Nakai retains it as a distinct species with the pubescent-fruited kinds. The horticultural variety known as Versicolor, however, as far as I have seen it, seems to be different.

Separation has been made in the Japonica group, *Diervilla decora*, Nakai, Journ. College Sci. Imper. Univ. Tokyo, xlii, 117 (1921), with leaves floccose on veins underneath, flowers at first yellow-green but turning red; it is *D. amabilis*, Hook., not Carr., in Bot. Mag. 4893. Japan. I have not yet been able to recognize this species clearly in cultivated plants, and reserve the subject for further study.

How far *Weigela japonica* is typically represented in cultivation outside botanic gardens is difficult to say. The derivatives of it are not readily distinguished from those relatives of *W. coræensis* that appear to have had a partial parentage of pubescent species. Some at least of the weigelas with variegated leaves appear to belong in the Japonica group.

† **W. japonica** var. **sinica,** n. tr.

Diervilla japonica var. *sinica*, Rehder., Mitteil. der Deutsch. Dendrol. Gesell., no. 22 (1913) 264-5.

Leaves somewhat longer-petioled, petiole sometimes to 12 cm., and soft-pubescent underneath (at least on nerves): corolla suddenly contracted at or below the middle into a narrow tube, pale pink.—Central China; perhaps a distinct species. The ovary is described as densely pubescent. In Journal of the Arnold Arboretum, viii, 199 (1927) Rehder and Wilson report specimens differing in less pubescent leaves and nearly glabrous ovary. I have not seen var. *sinica* in cultivation.

++ ++ Corolla-tube cylindrical in lower half or more, then suddenly expanded, Fig. 26a: color crimson or white.

2. **Weigela hortensis,** C. A. Meyer, Bull. Phys.-Mathem. Acad. Imper. Sci. St. Petersb., iii, 219 (1855).

Diervilla hortensis, Sieb. & Zucc. Fl. Jap. i, 70, tt. 29, 30, 33 f. ii (1835).

Diervilla japonica var. *hortensis*, Rehder in Bailey Cyclo. Amer. Hort. 484 (1900).

Leaves all petioled, ovate to seldom obovate or oblong, long-acuminate to cuspidate, crenate-serrate, soft-villous or tomentose underneath: common peduncle manifest, about 3-flowered: corolla cylindrical to the middle or beyond and then abruptly expanded, light pubescent outside, crimson (a white kind), the lobes nearly acutish and equal: capsule glabrous.—Japan.

I have not seen a plant in cultivation with the corolla-form and other characters represented by Siebold and Zuccarini in their *hortensis*. Makino considers it synonymous with *W. japonica*. Rehder holds it as a separate species in his recent Manual of Cultivated Trees and Shrubs, as it was earlier treated by Dippel and by Koehne.

+- +- Fruit hairy: corolla very hairy to glabrescent.

++ Color of flowers deep crimson: corolla hairy or pubescent all over outside, somewhat irregular, Fig. 26b; anthers conspicuous, often exserted.

FIG. 26. WEIGELAS, small parts of the illustrations in Siebold and Zuccarini Flora japonica, 1835, there named as Diervillas—a, W. hortensis; b, W. floribunda; c, Diervilla versicolor; d, W. coræensis (grandiflora).

3. **Weigela floribunda,** C. A. Meyer, in Bull. Phys.-Mathem. Acad. Imper. Sci. St. Petersb., iii, 219 (1855).
Diervilla floribunda, Sieb. & Zucc. Fl. Jap. i, 73, t. 32 (1835).—Fig. 26b.

Leaves short-petioled, or subsessile on vigorous shoots, ovate to ovate-oblong, rounded or cuneate at base, acuminate, serrate, villous-pubescent underneath as are the twigs and flowers: corolla dark crimson, cylindrical below and gradually enlarging upward, 2.5-3 cm. long, the lobes somewhat narrowed or acutish and unequal; style more or less exerted: capsule hairy, short.—Mountains, Japan.

The identity of *Diervilla multiflora,* Lemaire, in L'Illustration Horticole, x, t. 383 (1863) is doubtful although it is commonly referred as a synonym to *D. floribunda.* The plate, t. 383, is legended "Diervilla (Weigelia) floribunda (von Siebold)" but the text is under the heading *Diervilla* (*Weigelia*) *multiflora,* with the synonym "(Diervilla [Weigelia] floribunda Hort. nec Sieb.)" There is a considerable discussion of it in the accompanying text. The plate shows hanging clusters of fuchsia-like flowers with long-exserted stamens and style, quite unlike the plate and description of *D. floribunda* in Siebold and Zuccarini Flora Japonica.

It seems to be customary to apply the name *floribunda* to the cultivated plants with very dark-colored rather narrow pubescent corollas from which the stamens are exserted or show very prominently in the throat (in part because of color contrasts) although it is difficult to harmonize them with Siebold and Zuccarini, the authors of *Diervilla floribunda.* Perhaps we have here a garden set or series of unrecognized origin.

Plants that have come to my hands as *Abel Carrrière, Desboisii, Hendersonii,* are apparently of the Floribunda relationship, as here outlined.

++ ++ Color of flowers yellowish-green or yellowish-rose: corolla practically regular and less hairy to glabrescent, anthers not exserted.

† 4. **Weigela subsessilis,** n. tr.

Diervilla subsessilis, Nakai in Tokyo Bot. Mag. xxxii, 229 (1918); Flora Sylvatica Koreana, t. 41 (1921).

Differs from *W. floribunda* in leaves all subsessile and base mostly distinctly cuneate, with loose spreading hairs on veins underneath, pedicels and ovary loosely hairy, flowers glabrous or nearly so, and yellowish-green or yellowish-rose; style included or exserted: capsule sparingly hairy — Korea. It is probably not in horticultural cultivation.

** Leaves, exterior of corolla-tube, glabrous or essentially so, young growths glabrous, or with lines of hairs in *W. suavis.*

+– Petiole prominent: leaves thickish, broad, ovate to obovate and base cuneate.

5. **Weigela coræensis,** Thunb. Trans. Linn. Soc. ii, 331 (1794).
Diervilla coræensis, DC. Prodr. iv, 330 (1830).
D. grandiflora, Sieb. & Zucc. Fl. Jap. i, 71, t. 31 (1835).—Fig. 26d.

Glabrous shrub, or leaves sometimes lightly pubescent on veins underneath: leaves all petioled, obovate or broad-elliptic, long-cuneate at base, narrow-acuminate, serrate: flowers several on an evident common peduncle, whitish or pale rose changing to carmine; corolla cylindrical at base and gradually enlarging upwards, 2.5-3 cm. long, lobes acutish to obtuse, nearly equal: capsule glabrous.—Japan. The species is somewhat grown. I have taken it in cultivation in China. Some of the stock known as *arborea* belongs here; the variety Eva Rathke is much like it, perhaps a hybrid; *Lavallei* looks like a combination with *W. floribunda*.

+– +– Petiole short or none: leaves narrow, ovate-lanceolate, rounded at base.

† 6. **Weigela suavis,** n. tr.
Diervilla suavis, Komarov in Fedde Repert. Sp. Nov. ix, 391 (1911).

Graceful shrub, the young parts with crispy hairs: leaves ovate-lanceolate and acute, base rounded, to 5 cm. long, dentate, more or less ciliate but otherwise glabrous except sometimes sparsely hairy on rib underneath: flowers 3-5 on a common peduncle, rose-violet outside and pale rose or pink inside; corolla cylindrical at base, irregularly funnelform, minutely puberulous outside, about 2.5 cm. long; style and stamens included.—Manchuria. Probably not in cultivation outside botanic gardens or test grounds.

§ 2. CALYSPHYRUM, A. DC. l.c. Calyx divided half way or less to the base (sometimes a little more), the lobes lanceolate and mostly not ciliate or not markedly so, Fig. 22a: fruit glabrous; seeds not winged.

* Corolla campanulate above and abruptly contracted below, the lobes large and spreading: calyx long, not evidently 2-lipped.

+– Leaves glabrous above, more or less pubescent to tomentose on veins or ribs underneath.

7. **Weigela florida,** A.DC. Ann. Sci. Nat. ser. II, xi, 241 (1839).
Calysphyrum floridum, Bunge, Enum Plant Chin. Bor. in Mem. Acad. Imper. Sci. St. Petersb. ii, 108 (1835; paper read and perhaps published 1832).
Diervilla florida, Sieb. & Zucc. Fl. Jap. i, 75 (1835).
Weigela rosea, Lindl. Journ. Lond. Hort. Soc. i, 65 and 189, t. 6 (1846).
Diervilla rosea, Walpers, Ann. Bot. Syst. i, 365 (1848-9).

The commonest weigela of old yards and gardens, in many derivatives, first described from cultivated subjects, known by its large bulging wide-open bright-colored corolla which, in full anthesis, may be nearly or quite

as broad as long: erect bush to 3m. or more, young growths with 2 stripes or rows of hairs: leaves short-petioled to nearly sessile, elliptic, ovate-oblong or somewhat obovate, acuminate, serrate except toward the narrowed or rounded base, glabrous above except perhaps on rib, pubescent or tomentose on veins underneath: flowers mostly in 3's or 4's (1-6) on short lateral twigs and mostly without evident common peduncle beyond the upper pair of leaves, but the cluster sometimes several-dichotomous; corolla broad-campanulate above but abruptly narrowed toward base (Figs. 21, 22), 2.5-3 cm. long and nearly as broad at mouth, with obtuse spreading somewhat unequal lobes, more or less pubescent outside, usually deep bright rose or pink and lighter-colored within (but varying to white), sometimes somewhat striate; ovary somewhat pubescent or hairy but capsule glabrous.—Northern China, Korea. †Var. **variegata** (*D. florida* var. *variegata*, Bean. *D. Sieboldii*, Hort.) has leaves edged with yellowish-white; but there appear to be two variegated things, one of them of the Japonica relationship; probably all of them are wide variants or crosses.

Weigela hybrida, Hort., is an uncritical name for garden forms on the assumption that they are hybrids Its application is mostly to the Florida group, but how many of the horticulturally named varieties are hybrids is undetermined and the origin cannot be reliably made out on the basis of superficial resemblances; records of garden origins are notably indefinite and inexact. The Florida group, as here understood, comprises forms more nearly resembling *Weigela florida* than other species and apparently derived wholly or in part from that species; the departures are largely in flower-color, stature, season, and floriferousness. The large bright bulging corolla and broad calyx-lobes distinguish them.

To the Florida group are to be assigned *Weigela alba*, Carr., Revue Hort. 1861, 331; *W. candida*, Carr. l.c. 1879, t. 130, but some of the Candida in cultivation is of the Japonica group; *W. Isoline*, VanHoutte, Fl. des Serres, xiv, 142, t.1445 (1861); probably the rusty-red foliaged *W. rufa*, Carr. l.c. 1876, 400; *W. Stelzneri*, Van Houtte, l.c. 142, probably belongs in this group but more than one plant may be passing under this name. Plants I have taken in cultivation as *arborea* (see *W. coræensis*), *biformis*, *gratissima*, *intermedia*, *Lowei*, *rosea*, *Symondsii*, *Vanhouttei*, *venosa*, *Verschaffeltii*, are of this group.

Weigela pauciflora, A.DC. Ann. Sci. Nat. ser. II, xi, 241 (1839) is named by Carrière also in Diervilla (Rev. Hort. 1853, 310). It is generally regarded as synonymous with *W. florida*, but probably the type specimen should be examined to determine its identity. As described by DeCandolle, the flowers are solitary or in 3's whereas they are said by him to be 2-4 in *W. florida;* leaves and corolla larger than in *W. florida*.—Northern China.

† **Weigela Wagneri** (*Diervilla Wagneri*, Kumenzow in Gartenflora, xlviii, 201, t. 1461, 1899) is a recorded hybrid between *Weigela florida* and *Calyptrostigma Middendorffiana*. The anthers are separate and the plate

might well represent one of the *W. florida* group although the calyx as represented is hardly characteristic. The plant was sterile. It is reported as very hardy, with blooming season midway between the early Calyptrostigma and the June-flowering *W. florida*.

++ Leaves pubescent or soft-pubescent on both surfaces.

† 8. **Weigela præcox,** n. tr.

Diervilla præcox, Lemoine in Gartenfl. xlvi, 393, t. 1441 (1897).

An early-flowering species with flowers in short axillary clusters and frequently from the terminal winter-bud, known by its leaves hairy above and soft-pubescent underneath: flowers 3-5, nodding on short lateral branchlets and with common peduncle lacking or very short; corolla narrow-funnelform, abruptly contracted below middle, 2.5-3 cm. long, lobes relatively small and nearly equal, purplish-pink or rose-carmine and yellowish in throat: capsule glabrous.—Korea, Manchuria.

The name *Weigela præcox* has appeared in catalogues and it is also in Standardized Plant Names (1923), but it cannot be regarded as technically published there.

A good number of the early Weigelas represent this species, its variables or hybrids, as Avante-Garde, Bouquet Rose, Daubenton, Floreal, Gracieux, Le Printemps, Vestale, as herbarium specimens seem to show.

** Corolla with slender cylindrical tube in lower half and gradually enlarging into campanulate upper part with small lobes: calyx small, 2-lipped.

† 9. **Weigela venusta,** n. tr.

Diervilla florida var. *venusta,* Rehder in Bailey Stand. Cyclo. Hort. 1008 (1914); Bull. Arn. Arb. i, 24 (1915).

Diervilla venusta, Stapf, Bot. Mag. t. 9080 (1925).

Handsome very floriferous and hardy species with rather small oblong, elliptic or somewhat lanceolate leaves 3 to 5 cm. long or larger and obovate on vigorous shoots, nearly or quite glabrous: flowers rose-purple with somewhat paler limb, in close clusters along the twig and sometimes from terminal winter-buds; corolla campanulate above and gradually narrowing into a long slender cylindrical base, lobes small and obtuse and equal; calyx small, about 8 mm. long, 2-lipped to about the middle: capsule glabrous, short.—Korea, N. China.

ARTICLE 3.
THE CASE OF MUEHLENBECKIA

A DISCUSSION OF THE WIRE-PLANTS AND RIBBON-BUSH

At least four species of the polygonous genus Muehlenbeckia are grown in the United States: *M. chilensis* from Chile and Peru; *M. complexa* and *M. axillaris* from New Zealand, the latter under the horticultural name *M. nana; M. platyclados* from the Solomon Islands.

In a recent review of the genus J. Francis Macbride (in Publication 244, Field Museum of Natural History, Chicago, Botanical Series Vol. IV, No. 5, 1927) has used the Rafinesquian name Calacinum in place of Muehlenbeckia and has arranged the species under it, finding the name "validly published and apparently in every respect tenable." The validity of Calacinum had been stated, as in Standardized Plant Names, but new combinations under the name appear not to have been previously made.

In Flora Telluriana Rafinesque states the contrasts of the new genus Calacinum with Polygonum, Fagopyrum, and Helxine, and adds that it is intermediate between Polygonum and Cocolaba [so printed]. He names two species, citing their previous generic position: *C. adpressum* which is *Polygonum adpressum* of Labillardière and *C. australe* (*australis*) which is *Coccoloba australis* of Forster. All this constitutes clear publication.

The generic name Muehlenbeckia has been proposed for retention in the list of *Nomina conservanda*, to be presented to a future International Botanical Congress; see Kew Bulletin, 1925, p. 343.

The four Muehlenbeckias known horticulturally in the United States become, under Macbride's arrangement, *Calacinum chilense*, *C. complexum*, *C. axillare* and *C. platycladum*. The generic synonomy is stated as follows:

Calacinum, Raf. Fl. Tellur. ii. 33-34 (1837).
Karkinetron, Raf. l.c. iii, 11 (1838).
Sarcogonum, G. Don in Sweet Hort. Brit. ed. 3, 577 (1839).
Conobaea, Bert. ex Steud. Nom. ed. 2, 1, 404 (1840).
Muehlenbeckia, Meisn. Gen. 316 (1840) et Comm. 227 (1840).

The four species are of two very unlike groups. The first three are wire-plants with hard slender stems, of prevailingly scandent or prostrate or viney or tangled habit, and *C. platycladum*, the ribbon-bush or centipede-plant, an erect shrub with flattened leaf-like green articulated stems and wholly different appearance, strongly suggesting Xylophylla (Phyllanthus) of American tropics, a resemblance to which Von Mueller called attention when he founded the species in 1858.

The ribbon-bush I have known for many years and have it in blossom as I write, together with *C. complexum*. I have never been reconciled to its inclusion in the genus Muehlenbeckia. Its botanical disposition has been in three accepted genera, indicating doubts as to its affinity. It starts with Mueller in 1858 as *Polygonum platycladum*, under section *Homalocladium* erected specially for it. The plant next appears in Mueller's account in Botanical Magazine as *Coccoloba platyclada:* "Indeed it is not improbable that our plant is referable to *Muehlenbeckia*, under which name it has been distributed from our herbarium, or it may, on future examination of the embryonic characters, be proved that the plant represents a peculiar genus, to which then the published sectional name, *Homalocladium*, may be given." This is very close to actual founding of a generic name, but Mueller left the plant nevertheless in section Homalocladium of Coccoloba and his suggestion or recommendation can hardly be accepted as publication of a genus. It next appears, under another modification of the specific name, as *Muehlenbeckia platyclados* by Meissner, Homalocladium having been carried over with it and carefully defined as "die neue Section, welche unsere Pflanze in der Gattung *Muehlenbeckia* bildet." Bentham and Hooker speak of it as having characters of Polygonum and Muhlenbeckia. I am convinced that it is now time to raise the sectional name to full generic rank. Some of the contrasts of the two groups are shown in Fig. 27.

The plant is peculiar with its flat foliaceous usually leafless branches, vanishing ochrae or sheaths, and its practically sessile flowers on the edges at the joints. The fruit is a colored berry formed of the enlarged fleshy calyx, but it is seldom produced in cultivation. In Calacinum (at least of the New Zealand region) the calyx may or may not be accrescent, and the fruit, if baccate, is white or whitish, the style is 1 or the parts at least not long, the stigma capitate and 3-lobed and fimbriate or papillose. The ribbon-bush has nothing of the wire-like or viney habit of the Calacinums (Muehlenbeckias). The true leaves are on the young or sterile shoots and are usually infrequent and of rather brief duration, elongated rather than more or less orbicular or very broad as in Calacinum; in Engler and Prantl, Die Natürlichen Pflanzenfamilien, Dammer speaks of them as "fleischigen" but they are not so on a living plant on my table at the mommment or on other plants I have observed.

HOMALOCLADIUM, gen. nov. Polygonacearum.

Polygonum sect. *Homalocladium*, Muell. Trans. Philos. Inst. Vict. ii, 73 (1858).

Muehlenbeckia sect. *Homalocladium*, Meissn. Bot. Zeit. xxiii, 313 (1865).

Affine Calacino (Muehlenbeckiae): corpus plantae cladodibus constat, ochrae eciliolatae brevi tempore se rumpentes: flores singuli vel in parvis capitulis in margine cladodis; styli 3: fructus baccatus, carnoso accrescenteque calice, rubens vel atropurpureus, apice sulcatus.

It is not necessary to attempt a minute differentiation on this occasion although some of the contrasts with Calacinum may be indicated. The genus is known particularly by its habit (not being a wire-plant), the branches all cladodes and jointed and striate, leaves present only on young or sterile shoots and without true petiole although perhaps narrowed into

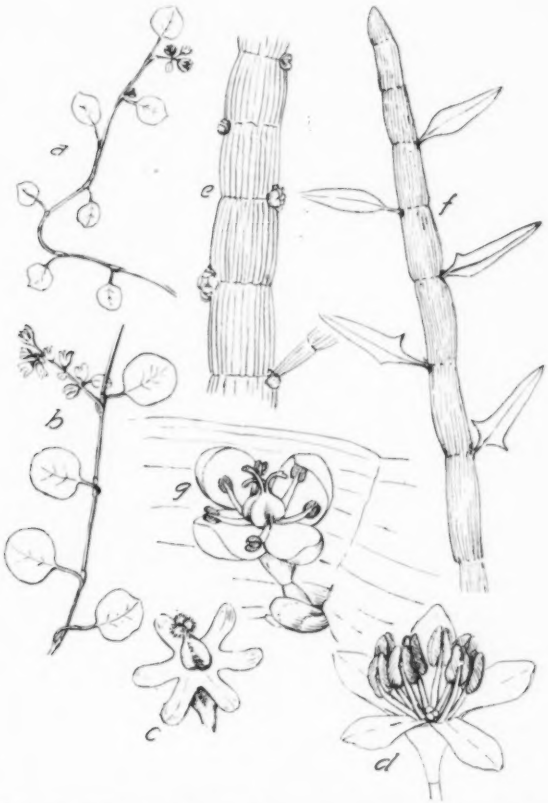


FIG. 27. CALACINUM AND HOMALOCLADIUM.—a, b, twigs and flowers of Calacinum complexum; c, d, pistillate and staminate flowers of C. complexum; much enlarged; e, flowering twig of Homalocladium platycladum; f, leaf-bearing shoot of same; g, bisexual flower of same, much enlarged. Twigs about five-eighths natural size.

a stem-like part, sheaths not ciliate and soon remaining only as vestiges on the broad stem, flowers very small and solitary or 3-7 in little head-like sessile bracteate clusters at the joints (not racemose or spicate), bisexual but perhaps functionally diclinous; perianth parts 4 or 5 or perhaps more (Von Mueller says 5, I find 4 and 5, others report a greater number), separate to base; styles 3 on the single triquetrous pistil, the stigmas not fimbriate although perhaps somewhat erose; fruit red or purple, baccate from the accrescent fleshy calyx, strongly sulcate on top, containing a free triangular smooth akene or nutlet. Species 1.

† **H. platycladum,** n. st*. Fig. 27e, f, g.

Polygonum platycladum, Muell. Trans. Phil. Inst. Viet. ii, 73 (1858).

Coccoloba platyclada, Muell. Bot. Mag. t. 5382 (1863).

Muehlenbeckia platyclados, Meissner, Bot. Zeit. xxiii, 313 (1865).

Calacinum platycladum, Macbride, Field Mus. Nat. Hist. Bot. iv, 115 (1927).

RIBBON-BUSH. CENTIPEDE-PLANT.—Upright glabrous shrub, 2-4 feet, much branched, attractive and odd in cultivation. In swampy places, Solomon Islands, S. Pacific Ocean.

*New status (*status novus*); see Gent. Herb. i, p. 8.